Notebook Series -- Notebooks by Edison
Notebook, N-17-09-15

This notebook, which covers the period September-October 1917, was used by Edison aboard the USS *Sachem* in connection with his work for the U.S. Navy during World War I. Many of the entries relate to visibility at sea and to camouflage experiments conducted under various light and weather conditions. These include experiments with ships camouflaged by different canvas panels, as well as experiments with painted boards of different shades erected on shore and viewed from Long Island Sound. Also included are notes on devices to measure the amount of light reflected at the horizon. Additional entries pertain to smoke bombs and to the amplification of sound underwater for the detection of torpedoes. On page 170 is a list of projects in progress, along with Edison's approximation of the "percent finished." Among the projects listed are camouflage, periscope sighting, a Smoke bomb 3" gun, an underwater projectile gun, a Lyle gun smoke bomb, and "still" and "moving" torpedo detectors. Edison's notes indicate that Mina Miller Edison accompanied him aboard the *Sachem* and that the vessel cruised among Gardiners, Plum, Fishers, and other islands, using Greenport, Long Island, as a base of operations. The notes are continued in N-08-09-10.2. Outline drawings of two freighters have been inserted into the book. The front cover is marked "Front." The book contains 197 numbered pages, a few of which are blank.

Sept 15 1917 (1)

9 am

Semicloudy day, whole covered with Clouds not thick, can look at sun only for an instant some blue patches all over, wind moderate breeze very few white caps but a small swell rolling seaward

½ mile off Fort. Boards in shadow

Lightest	No 6
next	1 & 5
"	4
"	3
"	2

243 are close in tint,

No 1 is the last two painted part of Jacket.

No 2 is 90% Lampblack stripes 10% White lead stripes, matted by Excess Lamp

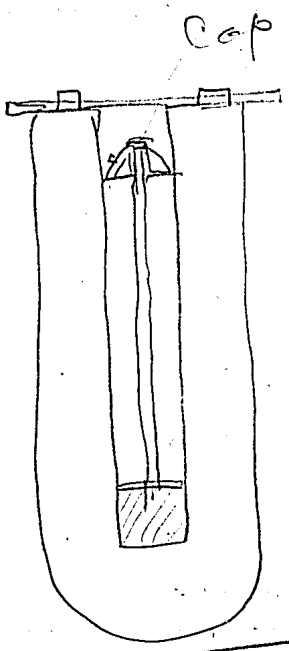
# 3	80%	Black	20%	white
4	70	"	30	"
5	60	"	40	"
6	50	"	50	"

2

10 30 am Cloudness abt same
all boards lighter
order of shade same as at
9 am — but 5 is shade
lighter than No 1

1050 - Cloudy — can look
at sun steadily thru
Clouds —
All boards shade
darker but very little
— this is surprising &
shows is meaning reformed
light by reflection
~~from clouds~~. Cloudy
top — ½ way down
blue opals = by squinting
the eye No 6 is least visible
No 5 next at 11 10 am

3



2" of fuse
+ Cap -
5 Seconds

No 6 is 50% black it is
probable that at this hour
& conditions of cloudiness
that 80% white 20 black
would be good movable
at 4 miles or so, & that

both sides of sun & shadow
Could be made measurable
at 4 or less miles
But not in bright
light.
Therefore with
proper tubs & more
Cameras we are OK
both sides on
Cloudy days !!

By carrying Rolls
of 95 90 80 60 40 30
10 + 5 black
We can according to
Course of ship, change
to out Sun on Cloudy
& Hazy days

days & do considerable on
clear days ....

Only necessary to put
rolls in position when
Danger Zone is approached
& not at all when in a
great Storm when submarine
Cant operate. -

1 Roll 4 tubs 1st side - Dark
1 " 4 " other 2nd side light

for the morning when in
shadow light tub roll
goes on that side & dark
tub on other side —
Both changed at noon
or where shadow both sides

1155 am No 6 by squinting way down from Sachem 2000 ft away disappears –
Still cloudy – white caps
East all cover on sea
Cant look at sun but an instant –
wind fresh –
Considerable blue spots in sky
Not nearly so hazy as it was at 1050 am
about the usual haze
jutting from the Islands
as we had in Experiments
1 & 2 – & much less
than with 3

1205 Noon Sun obscured
Can look right at it
6 still least visible –
2 most conspicuous –
sky line is of course clouds
Want of light seems to be
Controlling factor
showing necessity of
95% black to 5% black
apparently the light in sky line dont change
be sure of this.

12 15 pm
Can still squint partially out
No 6 from Sachem.
2 is still very black
Sun obscured under dark
cloud
Think if 2 tints lighter
than 6 were used be ok
say 70% white

12.20 pm Sun out of black
Cloud into white cloud
No 5 lead Vis by a-gunt
2 still Black

Dinner

1235 pm Sun Demo obscured
by white clouds -
#6 best for movability
2 black

as sun gets momentarily
brighter at time
#5 is most movable

~~Yes the sun [illegible]~~
~~The bright reflection~~
~~on [illegible]~~ = Coffee

To make all the shades it
wants 1 Roll with 5 blacks
tints & 1 " " 5
whites tints —

100% white possibly cream for 100%
90
80
70
60
50
40 white —
30
20
10

1250 pm Sun Semi obscured
white cloud can just look
pr 6 most invisible still
2 blackest, yet sun shows
very bright / reflections on
waves looking west
but none looking East

This must be due to reflection of clouds as front is shady color

I just note complete white very bright reflection on water & dull below. So the rifts in the clouds. The front is obscured & not in a Rift

1 pm rift in cloud slightly opens on front, - No 3 most miserable -

When rift closes 6 is best,

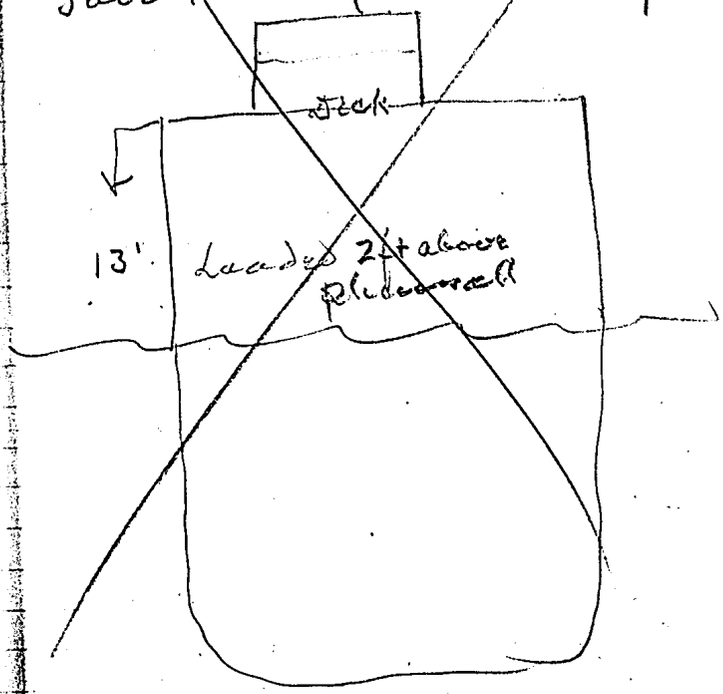
It might be called a dull day. Clouds thick & thin & sun nearly all time covered with either thick or thin clouds with rifts from dark to light clouds & occasionally a clear sky rift but 95% ~~[illegible]~~, obscurity of some kind with 50, 50 best, & probably should be either 60 or 70 white

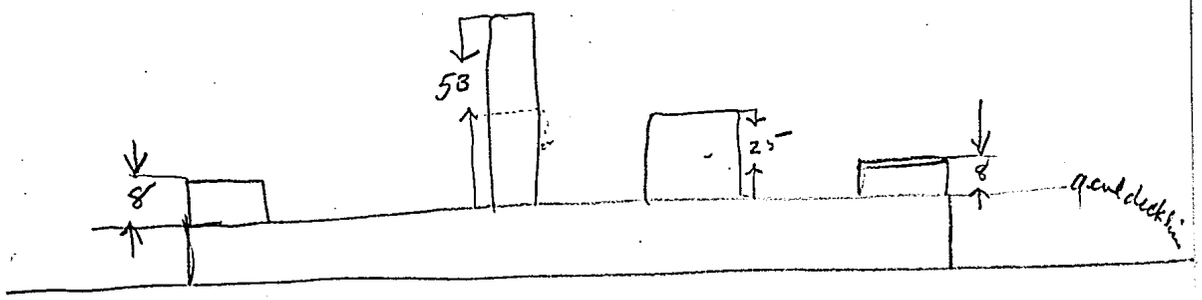
White Caps look very white East -

130 pm Rift. lighter
No 3 is least visible
its between 3 & 4
varying as closed Edge
of rift changes –
Now 4 & 1 least
visible –
#2 blackish –

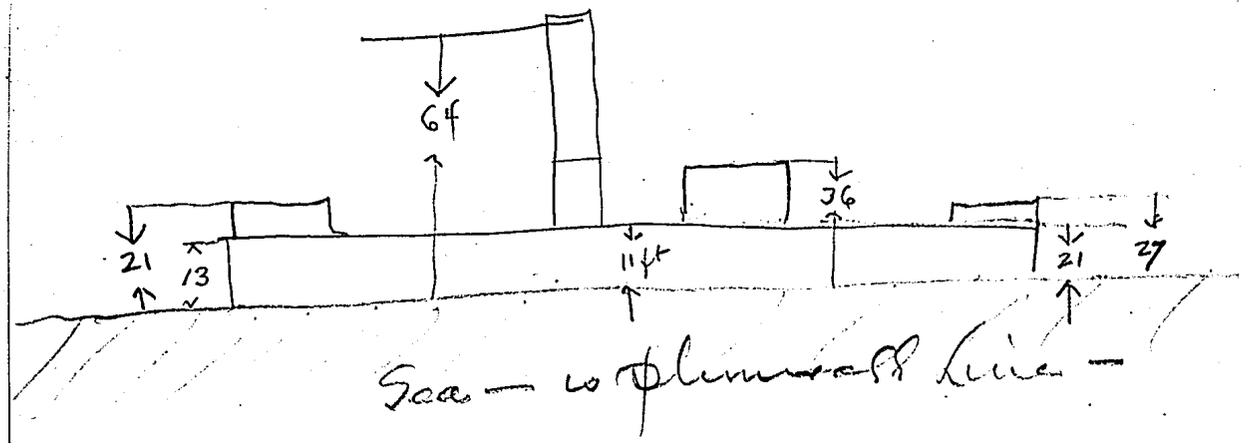
150 pm #3 best. (rift)
No 2 getting lighter
No 1 too white –
instantly changed to
#1 & 5 most invisible
Skyline seems unchanged

Cunard Cargo Boats.
3000 Ton General Type



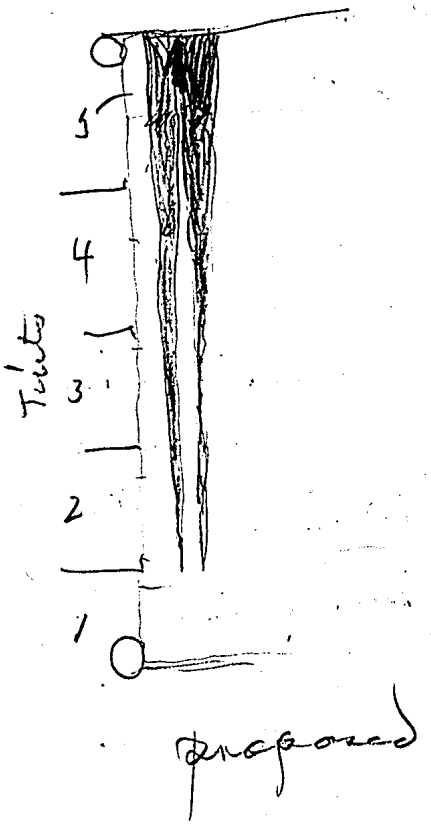

53
8
25
8
quarterdeck

16


64
21
13
11ft
36
21
29
Sea — to plimsoll line —

Hand

17



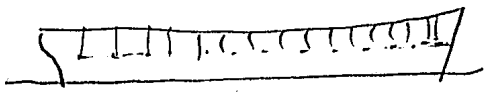
Canvas we have been using on Sachem .024 thick.

Yard 30" wide 36" long

The reason ~~3 4 5 6~~ why #2 is dark lading all time is no general sunlight only scattered rifts. Wind from N East,

247 psi – No 1 from Sachem by sqmnt is perfect sky line & uniform at one time for 10 seconds then gun changed by cloud this shows I could get tints right & light steady cannot see top of ship 1/2 mile away

from deck of sachem we are so close less than 1/2 mile, pbly 1/3 the bottom parts of board have a sea sky line –



We can have hooks put on redcoat boat & hook 30" wide canvas along ~~timber work~~ stripes, & easily removable. say 4 ft above water line – stripes fastened at rail & leaving flat against redcoat coat,

Standing on Pilot House deck all boards have a sea background – in condition of the light 3 is best. when sun obscured by a white cloud so can just look at sun suddenly became lighter than No 2 best against sea, squinted couldn't see it

Another change in light against sea background No 3 most invisible against sky line. No 6 most invisible

125 ft of 1/32 Canvas -
024 thick but allowing it to
be 031 thick rolled up on
4" roller. light would be
8.71 inches deep —
probably with creases would
not exceed 12" 125 ft
should give 5 lines 25 ft
each high from deck to
top of bridge -

1st Movie camera NG
2nd " fair obscure - 10X10
ft —
Wants 10 to 15 times as
much burnt at once to
do much good. 30 times
would obscure 10 @ 8 ft high
180 ft long - it creeps down

wind fairly good breeze
no white caps sun shining
three riffles #2 board
very least visible - 345 pace
in 2 seconds (Nov 14 4)
best as cleared paper

Fire can of oil with metallic Sodium in or Caphos to act it on fire K would be better.

Can of ammonia bottle HCl Conc when bomb burst gives smoke or Rags soaked in each in bottles, ditto Kieselguhr soaked in each -

Chloride Iron Can & Sulphate Iron — Black

Conc 40% NaOH & strong Sol. pyrogallic acid
" & Conc phenol Phthalein —

Barium Nitrate or most soluble Barium Salt + H_2SO_4 in another Can - or a very soluble - Salt of H_2SO_4 -

Concentrated Sol of Aniline black & other dark dyes -

Paraphenylendiamin & soda - oxidizes in air - mixed together -

ditto Paramidophenol -

Anhydrous HCl absorbed in an alcohol or other non water solvent into which is passed ammonia — on shell burning the alcohol Evaporates - The gases are freed in presence of water in the air combines as NH_4Cl

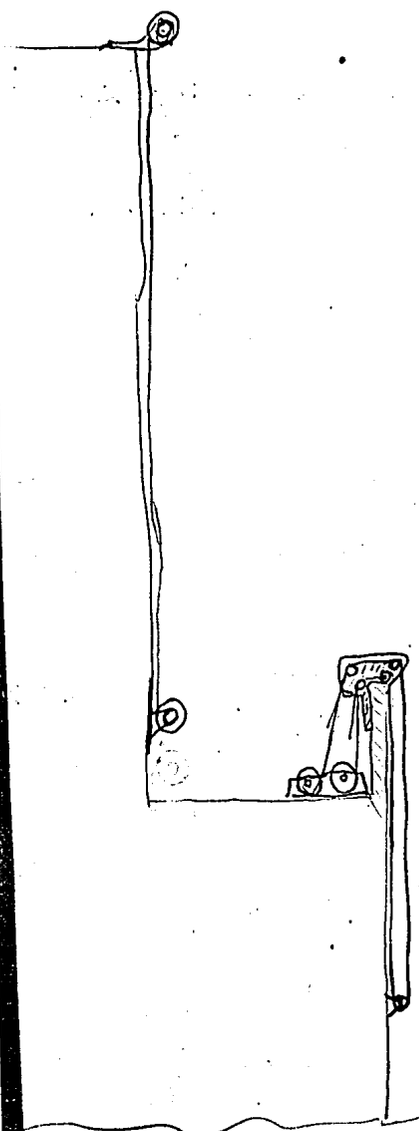
Life line No 4. Calipers 5/32.

" " No 7 " 15/64th

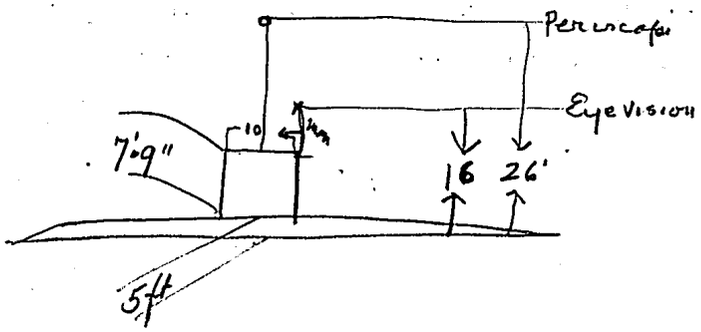
Hemp - very flexible —

Think that anhydrous gases absorbed in an anhydrous Volatile liquid which evaporates will do the trick as the gases will only Combine to give solids from water in atmosphere + gases will remain suspended till Enough water absorbed to give the solid by Combination — The moisture of the atmosphere being the necessary ingredient to form the Combination

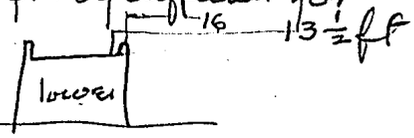
See what anhydrous Col SO_3 is soluble in — + if Chl Ba also sol -



Think the Govt should put say 9 Camouflage men & usual Complement of gunners on every Cargo ship & furnish all the Camouflaging Apparatus –



Greatest eye vision on German submarine Man standing on top of the Conning tower is 16 ft. by difficult for observation.



but for Constant observation of man standing on roof of tower is 13½ ft, The amount I have all along assumed for eye Vision –

The longest periscope is 26 ft from water line –

the periscope is not more than 6" in diameter, probably 5"

The outer diameter of Tower is 10 ft which makes a good mark or target.

The shorter periscope is about 21 to 22 ft.

I notice in Board tests standing on deck 11 ft above water that 1/4 of the bottom of board was on the Sea background

In tests with 10 boards measure this exactly when bottom board is free of sea back ground. Observing from 192 Air funnel test but from galleys at other times —

With Convoys - the smoke etc off destroyers will be notice of presence of Troop ships or Cargo boats, If destroyers would be careful about smoke it would be

better,

The best plan is for Cargo boats to keep apart, & distrayers 30 min steaming time away & no convoys

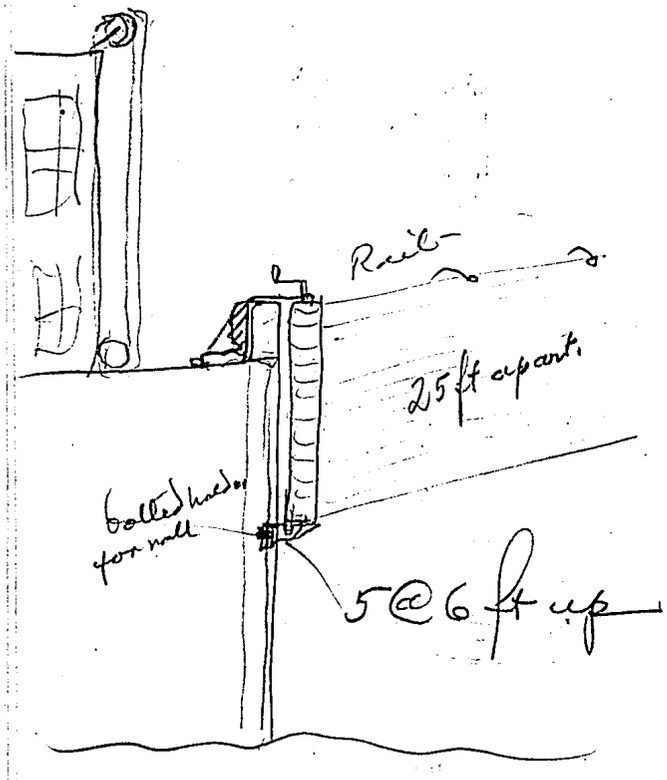
Torpedo boats should be ~~[illegible]~~ Camouflaged

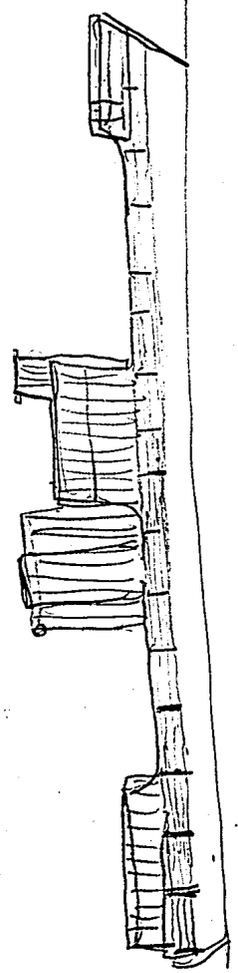
Our war masts should be Camouflaged above the turrets so enemy could not see from their masts our ships from a distance

Roughly requires 21000 yards 10 knots for 5000 ton Cargo boat probable Cost for Canvas $5000.

Camouscope

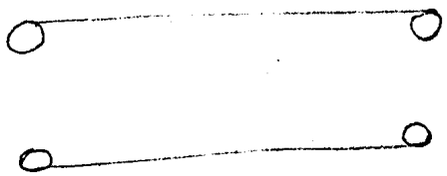
Camoumeter





Camouflage section.

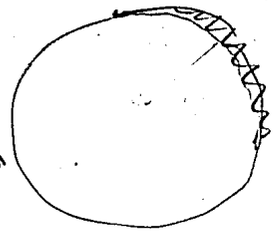
Possibly we can paint canvass on both sides then instead of changing rolls from sunny side to shady side ~~[illegible]~~ can shift rolls turning inside out.



Sept 19th —

My watch is 10 min slow - all time is by my watch

4.30. am Rosey East, stars out
all boards black
Can see that 8 9 & 10 not so black as others Rose behinds.



Worlds Atmosphere say twilight starts 4.14 am

Watch 11 minutes slow

My watch 4.45 a.m. (moonlit)
Its light enough to read by - shows on working
Sun not up —
4.46 getting very red
see clouds along horizon

Sun just a little to
~~left of~~ right of dock
Boards still black
8 & 10 show lighter
Can certainly use incandescent
lights - to stop silhouette
Sidehill shows points dead
to boards —
Can see Plum Island
shore plain - ditto on
right ... 3 miles.

452. Can read fine print
Can see 1 star dead overhead
Can not see lighthouse tower
dark - (get distance) 4 miles
Can see Plum Island
Light house

Sky overhead seems clear
yet along horizon there is clouds
It is going to be a very
clear day I think —
land on every side even in
distance is plain with
Eyes & very little haze
although sun is not up —
The aurora is now very
brilliant - but cant see
the light house on night
a long distance away
see light. 5 can see
Plum Island light house
with glasses —
Boards very black
sky line in aurora very
dark at horizon extending up
twice thickness of Dock then

dirty then clouds show faint red then - redder, then very bright sky above yellow color & very bright.

Houses on Plum Island white, more so than sky line - bx ok on sunside

5.10 am sun not up yet Boats dark but can see that 8 9 + 10 getting much brighter -

5.07 - can see 8 9 + 10 are white than yesterday -

5 10. clear above gone 8 9+10 getting much brighter but much darker than sky line -

5 12. Rosey fading out fast.

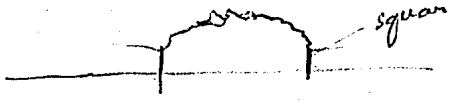
~~Entire~~

8 9+10 commencing to show darker by squinting - & can see they are whitish by full eye but darker than sky line -

5.20. squint shows 8 9+10 much better - well and squint show decided white - 7 shows dark 1 v dark

5 22. Sun Edge appears at Edge of horizon -

Jagged Edge



8 9 10 - squints decidedly

5 25 Sun all above horizon hard to look at very bright yellow - showing rather clear horizon

5.27 - by powerful aquint
Can almost make 8 9 + 10
disappear -
Sun now lights up sky &
Islands towards greenport
which were not clear before
it emerged

5.35 - 8 9 + 10 by eye look
white but are too dark for
skyline -- The skyline
between towards is too yellow
to not white - if it was
they could have been aquinted
out long ago. Color is noticeable
here in morning
it would need Carbon fils
low down to get yellow
off brown on ships as
long as skyline next to

still continue to have some
of the before zen near aurora
it is possible that the
color before dawning affects
sun comes up that jumps
the white towards -
This I think can easily be
overcome with Incandescent
yaat lights to give same color
as Aurora skyline after
sun is up

5.52 - 8 9 + 10 still not
able to aquint away much
still entirely unsatisfactory
on account of yellowish
skyline - which is very
different from white,
possibly as only need white
in morning 9 + 10 can have
2 yellow shades (10)

The last part to make all white can be tinted yellow - or perhaps all the white after - At 6 can see a few more and more yellow till 10 is early morn aurora -

with hole in paper all boards are dark. no difference between them -

with open eye you notice the 2 handles deadly but as against sky line they blend out all alike, as dark.

6 am -
sky line getting less yellow

It is doubtful if yellow tint white paint on boards will do, it seems to be want of light + perhaps time at 6 05 yellow tint almost gone, sky line very bright with light whereas white is just seen against light, perhaps Carbon

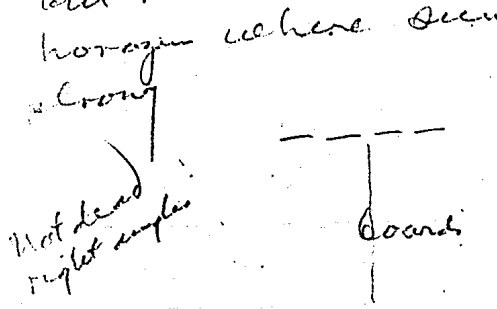
lamp foot light will aid

6.16 am still not enough light on 10 -

6 20, Cant see any yellow tinge to sky line hence yellow tinge probably not necessary

(it wants Light =)

Can see with glass that light house way off & right of many boards do its pretty clear sky looking but 4 white clouds around horizon where seen above cross



630 am
Can now notice that 10 is getting more light & squint shows the different hues of all very plainly but very unsatisfactory

6.37 - more decided change to the better by squint

645 am
Think if there was clouds overhead NO 10 would be OK but sky in blue overhead and clouds to reflect back on #10 it gets its light from reflection from sides which has slight walls 1" high supposed (very little wind) the clouds on certain sky line

Clouded sky line in the west looks dark (10) clouds.

720 - #10 too dark yet

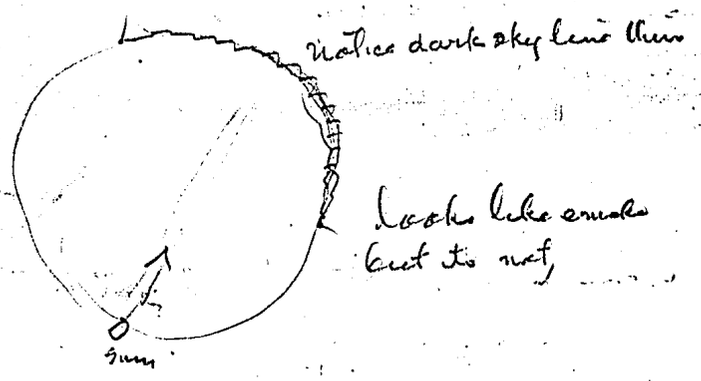
740 - 10 getting better, getting more white sky line getting less bright -

Very decided dif in tint from 1 to 10 - squinting makes 10 more conspicuous as to a want of light, where's - too much light is necessary to use squinting -

805 am - #10 coming closer to tint of sky line but not light enough on it

8.35 - #10 hasn't light enough yet but getting closer to tint of sky line

8 37 - perfectly clear sky above - ~~#~~ clouds along sky line -



8 45 am

I fear as we recede from #10 at present change of light reflected from it may get darker because when I appear it gets darker - + blends out ~~also~~ stronger against sky

I think on cloudy overcast light clouds overhead enough light well reflect back on #10 to do the business by 7 to 7 30 am but at 9 am not enough light reflected back to be as bright as sky line -

9-20 - #10 too dark yet not satisfactory -

On the bridge = not a single board has the tint of sea back ground, #10 too light 1 too black + none fit.

Lower down sitting on Stern 6 has a resemblance

Nothing is sure but will have to come to surface

If pm on sun side to get 16 ft or run periscope way up as short periscope will be no use inside ~~outside~~ 2 or 3 miles -

10 am - now 8 9 + 10 shows OK by squinting light fleecy clouds overhead not many but it serves to light up 8 9 + 10 Think this is entirely due to these clouds reflecting back + if there was no clouds it would be still unsatisfactory for want of light - 9 5/8 10 9 5/7 10 5/13 HT IIII

8 + 9 are stripped
8 was stripped at 8 to
8 30 - #10 is being stripped

10-17 AM - With straggling fleecy cloud above the sun 9 + 10 are now OK + will probably disappear in 3 @ 4 miles -
Can nearly wipe them out by squinting showing they are get lots of reflected light -

Sitting down -
10 42 am - 8 is least visible by squint
see very faint ripples gathering 8
fleecy clouds overhead thick and coming

According to this if fleecy clouds overhead shutter will take care of Camouflage from 10 am till dark -

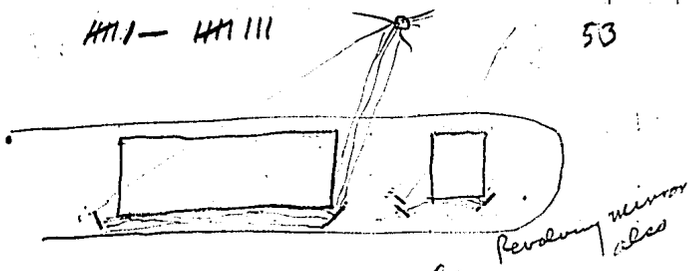
5½ hours it fails 8 hours OK

If no clouds overhead it will not start much of any before 11 20 am —
+ 7 hours it will fail
+ 6½ hours OK

Evidently some reflecting device must be devised to get on other side of boat in shadow

1050 7 is most visible by squint —

11 17 am 6 is most visible



This may not be affected by Rolling + 6x8 mirror thrown a streak 20 ft long - along Cabin very bright

Think 2 @ 2½ width of strips is widest should mirror less would be better making better limit. Close to with glass + calm making measurement of shutter better in fact 1 inch would be OK if Construction OK — 10 turns would be movement of 1/10 of inch — East time —

1130 — 6 best. Sun under cloud can look at sun

1157 - actually - 1207.
6 East = sun under fleecy cloud

1220 pm 5 to East
sun under fleecy cloud East
sky very bright, swift

1245 pm 4 to East,
getting hazy in the west at
horizon - bright fleecy clouds
blue & white spots small
overhead

In nearly every case
2 numbers ~~[illegible]~~ to
Each other are OK one Gray
slightly better than the other
showing range of 20%

19th
1250 to 3 East, 2nd -
1250½ pm Now to 5 6nd -
Rifs in sky

As the only light is white
with clouds + very light
blue - perhaps all the
white clouds have some
slight color, (what kind)
to match blue of sky line.
as I now see the sky is
BLUE behind boards
+ all along East so

So we have to contend with
bluish sky line under some
conditions, not sky blue but tinge
of bluish =

1 10 pm - my best ~~sky~~ sun went
under thick cloud - now comes

out a 4 is best - ? ?

If any blue is to be used it probably should be in every white stripe or seperate - 1/16 or less wide on shutter it could be on 2" white about 10 stripes 1/64 wide — perhaps the blue should be — the black + also white for bright + dull light.

120 pm Very Hazy west
Very clear East

For Rafts in sky all shutters should be Controlled Electrically so change be made in 2 seconds

1.42 pm # 2 best, 3 second best

146 pm standing on pilot house + viewing boards against sea as background No 1 is best No 2 2nd best.

Snow think sky line at all times has a tinge of blue although it looks white or dirty white —
+ This must be provided for —

2 17 pm # 2 best 143 2nd best.

2 18 2 best 1 2nd best.
sun clear clouds — 95% probably not heavy

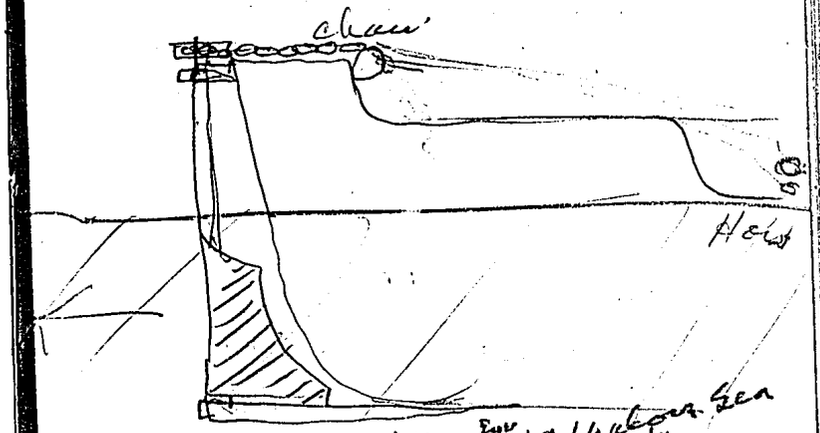
Think 50 50 should have a
thin streak of blue in each
& then - same in white & black
keeping % of white plus blue &
black plus blue same -

When equinoxing at 2 is best
there is a dirty black or
brown which if there was a
thin blue streak would
correct it & give it the
bluish cast of the Sky line -

no clouds overhead
No 2 best - 2.55 pm

East is no clouding up, slight bluish cast
West hazy - apparently
no clouds overhead

Bow Rudder



Standing on Port tack Equ 19 ft above sea
only fleecy clouds - little Haze

Sachem left fast for Newport
at 418 - 418½ full speed
Boards on sea background
No 1 best for this -
water line 3 ft above top of
board &
430 top of boards just
top or edge of Sky line on water No 2 best

4.42 No 2 gone & N'wark
Land still visible &
think some of coast
line -

4.47 Can just see
land 1 & 2 in sight
guess wholly on Skyline

450 - No 1 & 2 easy to see
No 3 almost gone

451 1 & 2 gone -

455 3 & 1 & 2 gone
boards all above
horizon 4.57 -

5 pm 4 gone -
still above horizon

~~501 5 gone~~

504 5 gone -

505 6 "

506 7 " sachem vent (↳ 9.71 knots

507 8 " 11.17 knots

510 all gone under

52 minutes

Looks as if all
was above sky line & cut
out by want of light -
& not due to rotundity of
the Earth. —

Hanford sitting at table
on Sachem rear deck using Eye only
Read it — his watch to
10 mem faster —

Started 4 30 — 451
419
32

440 2 very faint
445 2 gone — 3 2nd beat
448 3 gone 1 "
453 1 gone 4 "
459 4 " 5 "
500 5 "
501 1 weight again right's gone
503 1 gone
508 6 gone
516 7 "
518 8
519 9
520 all gone

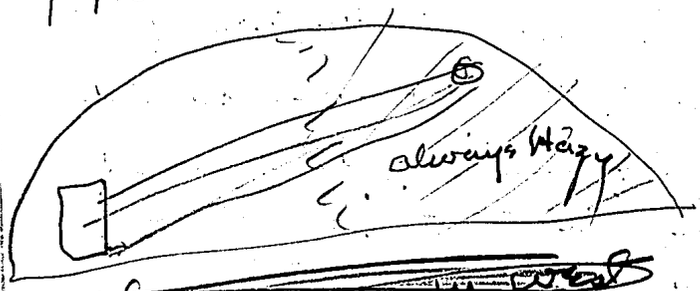
Note not much difference
between 19 ft high on
bridge & Hanford 19 ft only high
on deck — "
It seems to be a question
of light — & not reformably
of Earth in this Case

Sachem went 1134 ft
per min —

1134
32
2268
3402
5280) 36288 (6.87
36080
31680
46080
42240
3840

1 2 & 3 went in
6.87 miles

Phenomenon



~~When sun in West over Lap 12 noon~~

East always looks clear no haze but West always Hazy

Knot $1\frac{1}{6}$ land miles

~~6080 ft in Knot~~

No 4 went at 8.8 miles
5 9.85 "

Left Grampant 1145 (dock) probably - 1150 full speed - pilot House first saw white boards 1223 -

1239 - all visible Except No 3 - at 1239 -

No 3 faintly visible -

The haze is very strong today - Clouds all around horizon - blue sky overhead no clouds in certain directions haze almost as thick as a fog. First seen 6.87 -

No 3. first seen 3.57

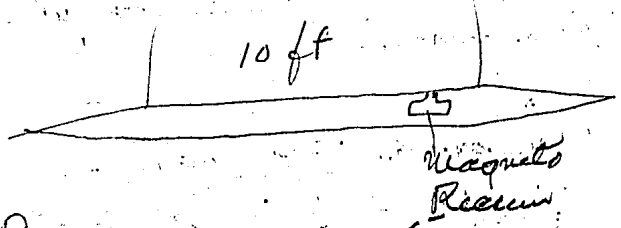
HCl anhydrous at 10 centigrade is liquified at 40 atmospheres
Spec g 1.27
1 at HCl Combines 3 atoms H_2O -
HCl liquid anhy does not attack Mg Zn or Fe

with can liquid Ammonia
Bow-gun can fire
NH4 + Slam gun
HCl - both guns fog
& when by diffusion
by wind with gas
NH4Cl fog -
or both can be fired
from one projectile -

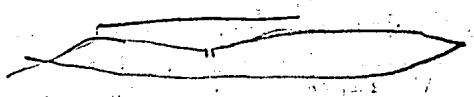
or 2 tins fired in 1 projectile -

I note sun shining on boards ~~blue~~ skyline between increases in depth of blue tint,
as sun gets lower 4 pm visibility shifts from #2 to #3.

Its probable No 2 white should be tinted light blue the tint of blue increasing as sun goes lower (10) towards 3, 4, 5,



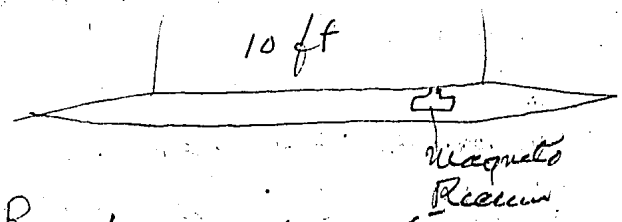
Runners carry water
Carried along sides of a
boat 10% Hence still
10 ft is enough smooth sides
probably to do the boy &
water of hole goes with,
the float & gives no noise



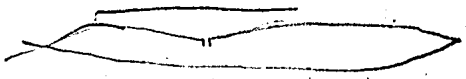
H_2O absorbs 1/2 its weight of Ammonia -

Chloride Ammonia
Volatilizes by heat without
Melting -

Hydrochloride of Hydroxylamine
Melts 100 Cent -
then decomposes with
violent Evolution of gas
into N HCl, H_2O & NH_4Cl
its Very sol in alcohol
Specif NH_4 0.76 Condenses
to liquid at 50 Cent -
~~[illegible]~~ at 0°C 4 atmos
28° 10 atmos



Runkin says water
Carried along sides of a
boat 10% Wenac still
10 ft is enough smooth sides
probably to do the boy &
water at hole goes north,
the float & gives no noise



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Melts 100 Cent -
Then decomposes with
Violent Evolution of gas
into N HCl; H_2O & NH_4Cl
its Very sol in alcohol
Sp Gr NH_4 0.76 condenses
to liquid at 50 Cent -
~~[illegible]~~ at 0°C 4 atmos
28° C 10 atmos

Experts Lyle gun Sept 19/17

No		Elevation	Charge	wt lbs	Range	muzzle vel	time of flight
1	L	42°	3 oz	18	385 ft	111	4.4
2	L	41.30 m	4 oz	18	884	169	7
3	L	44	5 oz	18	1715	235	10.2
4	L	35.30 m	5 oz	18	1211	203	7.3
5	L	35 30 m	5 oz	18	806	166	6
6	L	25 d	5 oz	18	440	136	3.9
7	L	15.30	5 oz	18	490	175	2.9
8	L	41 30	7 oz	18	3880	355	15.0
9	L	42.30	8 oz	18			

L series projectile cast iron solid used 3 ft of one inch rope for a tail, shot tail first, it turned & went straight

Large Reg Lyle gun black powder in cloth bags ignited by friction primer

A series						
10 A	42 30	2 oz	9 lbs	240	88	3.7
11 A	42 30	3	9	510	129	5.4
12 A	41 30	4	9	530	131	5.4
13 A	41 30	6	9	1550	224	9.2

Shelby tubing 19" long plugged both ends & filled with sand 3 ft rope tail –

B series	angle					
14 B	42.30	5 oz	9	945	175	7.3
15 B	43	7	9	880	169	7.1
16 B	32	8	9	700	156	5.1

B made of Shelby tubing 18" long plugged both ends & filled with sand – NO ROPE USED

Remarks

1 Projectile tumbled slightly
2 " " "
3 4 & 5 – no tumbling hit on end
6 & 7 Little tumbling hit on end
8 unable to find projectile but observed time of flight & calculated range – Rope broken off in flight
9 unable to find or follow it in its flight

10 & 11 Tumbled
12 " slightly
13 no tumbling hit on end
14 Tumbled
15 observed time of flight 7.5 sec
16 Little tumbling

21st – Sachem 2000 ft away

4 50 am – aurora – 20 ft above boards – from board up to 20 ft it is blue to horizon. Water showing front reflection from ~~[illegible]~~ light from aurora –

Can see 10 a little lighter than No 1

A & B yellow pine just as black as the others

I now can see to write,
Clouds all around horizon, apparently clear overhead

5 AM 22 Amp searchlight thrown on board & fort. Can see light on every board 8 9 & 10 very bright white. Covers circle 38 ft diameter

Now quite light on ship. good light even in good shadow from cabin which comes from the lo Eastern sky by reflection

No arc light now.

No 10 shows whiter than No 1

B with Eye shows yellow. A don't its the angle probably

As it gets lighter tried arc light again, 5 June 5 20 am – light from arc only just perceptible – apparently sky line gets brighter & faster than the reflected light from West side. that say 10 gets

No 3 Blued white part same black as 1 & 2

Both A & B very yellow & distinctive from 8 9 & 10 which look whitish –

Sky line East being so bright # 10 is in sharp silhouette & darkness – it needs light but don't get it from the West enough by reflection –

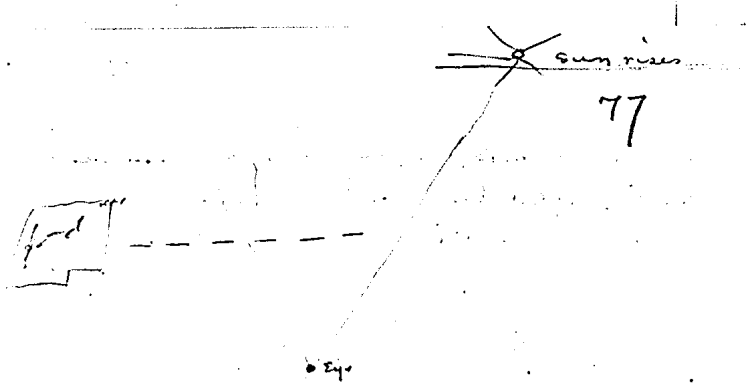
Aurora up higher now & nearly gone, sky line at 60 and blush white –

There may be some show for Incandescent foot lights in early morning but none later, Even one is doubtful but possibly ~~an~~ a 12 amp light for Every 100 or 200 sq feet arranged side ways or as foot light might do, but when sun gets higher will need mirror

5 30 am Sun up one diameter & scarcely Visible

9 & 10 Very white but sky line is so much brighter that its in dark silhouette, blind Casts to sky line 10 Wants light to bring out of silhouette –

Slightest squint blackens 10 but Can see difference between 1 & 10



No doubt that for shadow side pure white paint is best and early it must be illuminated & later strongly illuminated & still later probably only mirrors will do any good if at all

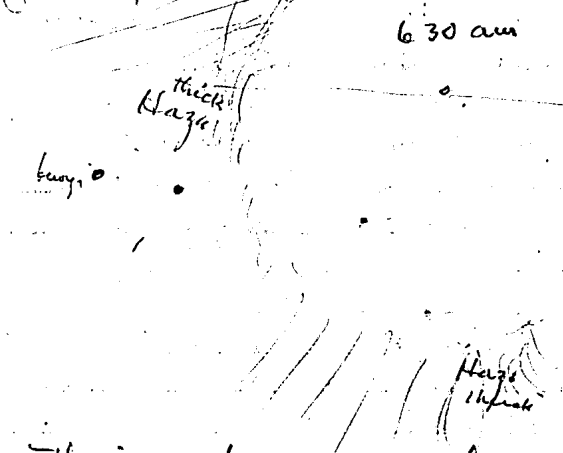
6 am Cant see Plum island on account of haze – West sky all bluish & hazy

Can just see land on right side with naked eye but not with glasses Land nearest sun & near its probably 2 @ 3 miles –

The sky is so bright now in

The East Hill even 10 only shows a tint of white. A + B black with faint yellow tint.

6 30 am



Everything in haze zone which to one looking West is more than 1/2 the horizon could see very little.

Even the 2 buoys 600 yds away look hazy - 6 30 am cannot see Plum Island

Strong silhouette is due to want of light + nothing else

* probably reflection from my face & everything on boat

The little ~~test~~ boards on sides of hold up in shadow show fine + are nearly same as sky line (1e) the white + 3 or 4 blue lines therefrom ~~[illegible]~~ * illuminated entirely by reflected light but the moment I make them in deeper shadow by covering with the hand they show dark silhouettes against sky line.

9 am all boards still in silhouette but not so sharp 10 is somewhat better than No 1

9 48 am — The fresh painted A + B with lead paint + just varnished now show up next to No 1 very distinctly white + is only slightly in silhouette slight fleecy clouds East to overhead blue from there West,

Apparently a strong illumination would make it OK by one or morrow

10 am can nearly squint out A+B painted white (lead paint)

Plum Island a land on south early seen but lots haze still

1024 – A+B pure white at present
Can nearly be squinted out, is now very valuable –
If could get a better white thick with fleecy sky 10 am it would be OK leaving only 5½ hours dangerous time, + not seen that up early haze will help

There is a decided gain between B (painted) + the 95% white of #10 –

1040. B can now be entirely squinted out. A is being squinted out on account of the angle which is favorable this seems easier than if it were at dead right angles to sun fleecy cloud bell overhead with blush spots. –

Note – white light produced by mixture of green + red – orange + blue yellow + violet,
see Watts, Light p 649

I note thru glass that B is not a dead white that its opaqueness + probably should have 3 coats to fully cover the yellow then it would squint out ½ hour earlier –

1050 #10 Cant be entirely squinted out yet – although B. is practically gone without squint.

1106 am I think I notice a change. B is getting whiter than 10 – A is still OK for measurably probably due to angle

1110 am 10 is better than B
B getting too white - A best yet.

1114 No 8 + A best.

Everything changes rapidly now as sun approaches meridian & quick adjustments which have to be made, every 2 or 4 minutes —

1117 - # 8 best now - A getting white

The large angle of Grounds to sun don't seem to make very much difference in time of change only question apparently of a few minutes

1121 - # 7 is the best.

1136 6 "

1149 5 "

12 noon 4 or 5 - best - 5 too light 4 too dark but gets —

1220 — 4 is the best

1226 4 " "

1.16 3 best, then has white (blue)

1 45 ~~best~~

When 80% White black is OK 80% White - Ultramar is perfect.

1-57 — No 9 best.

Sun is gradually obscured by clouds its hazy & getting dark in the west - Very hazy can see plum Island but faint - B has been too dark when sun was bright (1e) but if only bright sun - it no time today has been real bright — The

Sun is so obscured by
white clouds Cant find out
where it is at 210 -
but day is bright it would
be called Moderately
Cloudy No 6 is
best. at 210.

A is seen formed at
210 pm Look Violet -
watch 9 min slow by Hanfords
at 210 pm

My Impression is that
the shade of Ultramarine
should be 2 shades
deeper & probably Cobalt
Blue is proper blue

In any Event blue for darkening is
better than black as this is
first Case where skyline &
board was perfect.
While painting the white
board starting at one end
the board kept absolutely
darkening in rays so
perfect it was probably
showing the right sight for
80% stripes -
Perhaps for winter present
Ultram tint is deep
Enough as its darker in
Winter - In summer
a deeper shade could
be used
No 4 is slightly lighter than
A at 2,20 pm - but mp & luck
No 3 was blued on white so cant

Compare

2 22 A 10 best.

A + 1 2 3 + 4 + B look black best
A still has a bluish tinge
very decided by glass.

2.41 pm 5 as best.

4 + B look alike in shade

1 2 + 3 very black A
can nearly be squinted
out

2 43 Sun now shows 1 2 3
dark + A nearly squints out

2 45 - 3 squints out better than
A A being to Reddish violet.
+ Sky time getting very blue

2.47 3 + B best A prominent color
possibly Ultramarine not
deep enough for strong light
Sun can be seen + covered
thin clouds

One Cumond has above
dull on one side no ends -
2595 ft + the other 1600
sq ft to be Camouflaged
43 sections 6 X 10. + 27
for the other -
See how usual ends take -

---

4 12 pm I guess Ultra
Marine is too light but
not sure till I get
90 + 95% board

A is either painted bad or last part not dry. last part 2 or 3 shades deeper color

No 10 is now 90% white 10% Ultramarine blue

B is Dead white, (Lead)

Sun yellow 445 pm –

No 5 is yellow A ultramarine 80% is violet inclined to tinge red –

Have noticed night along towards sundown dark best is yellowish tinge yet sky line is pretty dark blue –

Lead must do something

Try Aluminum or metals matte paint –

5 pm – A violet 1 very black 2 black 3 dark 4 dark yellow 5 very yellow 6 lemon yellow 7 8 9 + 10 – less yellow –

B nearly white is white –

Started from cream point

5 04 pm – 5 least visible, + yellowish. sun yellow red

only read 1000 by Eye –

5	10	6	gone
5	11	5	"
5	13½	7	"
5	14	4	"
5	16 – only 9 10+11 visible		

Dock still Visible –

5.17 – 9 gone

Nine apart Cambridge
seen with glasses
A 1 2 + 3 mufy 4 5 6 7
8 9 10 + 11 or B.
All gone with Eye

Now glasses –

5.21 – 1 + 2 visible faint
10 + 11
Changing as sun
changes –
Dock visible

5 23 only 11 or B visible
now & then 1 & 2 flash up

5 25 11 only visible &
Dock gone
getting dark
Cant say if sun down
but think not –

5.26 – only an occasional
flash of 11 – as know
Exact position to look
for it at Edge of fort, which
can entirely be seen but
hazy

5 31 fort gone with glasses
just see it with Eye –

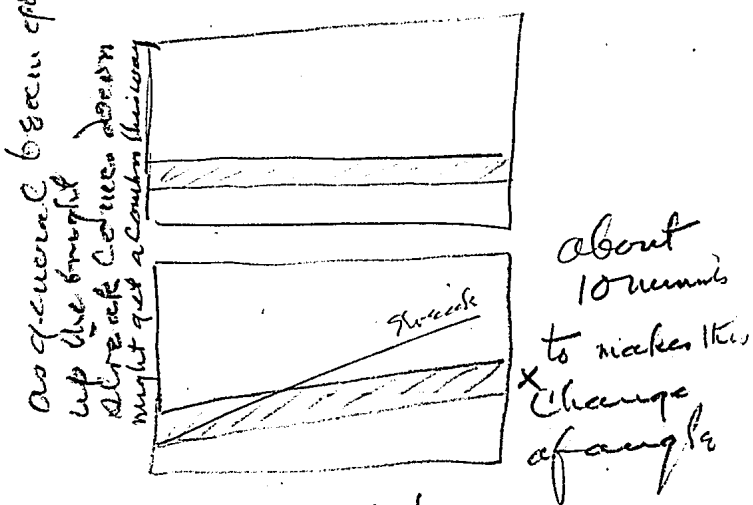
5 32 fort gone –

for 1st time in my life I notice
8 pm 2 hours after sun down
~~[illegible]~~ & now dark
Except 1/3 moon 2 hours
up that the whole
sky in every direction is
a deep shade of ~~[illegible]~~ BLUE
I have always previously
thought it simply
dark & without color
but its really BLUE

Went on Rampant started Engine
full speed 225 about Revs per
min — with teeth got
112 min sounds or half
of the Revolutions Cant see
why should get only 1/2
heads of cylinder.
Also a ~~[illegible]~~ Continuous grinding
sound like gears running
together, also unperiodic
shuddering sounds

of very great change in Volume
With Ear only heard Engine
a little —
But the whole boat
jarred badly — jarred
Every persons body, all the
papers were in vibration
With Bell Magnet lying
on Cushion on boat &
4 large Cushion, the
noise was terrible but
I could not recognize
the periodic noise of
the Engine, Evidently the
noise was due to the
Boat jar Communicating
to the Bell Magnets

I notice that the beam from the mirror grows shorter and the angle changes.



about 10 minutes to make this change of angle

which is $4\frac{1}{2}$ inches at X

I notice that the bevelled edge of the mirror throws a very brilliant

streak of light many times brighter than the general mirror —

Also I notice that the strong reflection of light from the clouds is reflected on the board which viewing end on or at a little angle from board is as strong as the general beam but viewing board in front contrast is low.

Diaphragm jarring it + this was amplified also it got our waves —

Jerry took diaphm out.

The noise was then very weak but could hear the Engine revolutions fine practically from the noise of air +

There should not have been any noise but undoubtedly the wheel on magneto was jarred by Engine + this amplified gave the Engine noise

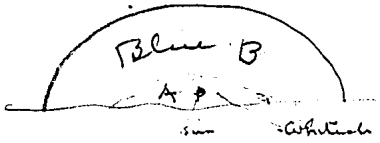
He will put diaphm back + plug air hole to see how much his diaphs to our waves distinct from jar

When Bryon Yacht is towed there will ~~not be any jar~~ ~~noise~~ be jar noises transmitted from the Hull of boat to the water thence to Magneto + we will be just as bad off.

possibly if a magneto was put close to the shaft or Hull bearing or a diaphm fastened to wooden hull + a magneto adjusted close to it, ~~[illegible]~~ that the waves would be generated in the same circuit + balanced against that from Bigoubat either at input or output each — by paying out more or less line the phases could be put to neutralization — as one would be local + the

Corresponding one lag
½ a wave length.
As Engine makes 4 Revs per
Second the waves in water
would be probably
11.23 ft long — ½ is 5.61
so line would have to
be paid out 5.61 ft
to neutralize the boat
roll. + the Volume
from Local Magneto
Regulated to be same as
from Bigonboat,

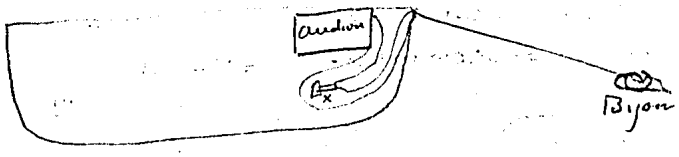
Clear sky Cumulus clouds in
fleecy on horizon



Later in day A uncovered

The whole of the sky except a
small section A is light blue
day is fine — + shadows are Not
deep plenty of reflected light
but can see any clouds except
on horizon but altho sky appear
blue + clear there must be
Clouds like those on horizon
thro invisible -

I notice in path of a boat
way out where sun shines on
Wake the water looks
dirty white no blue or
green at the 6 20 am angle



X is same kind of phone as in Bijou in series with audion + box shunted around it –
The jaws of boat sends waves into audion ckt while Bijou sends same waves into cement which it rests from boat
Then the waves –
The line hauling Bijou is let out till the waves are in opposite phases, the box is adjusted so volume or strength of waves from boat phone is same as Bijou phone
then there should be

Silence as far as boat sounds are concerned – The Bijou will then receive any outside sound free of boat sounds

If outside sounds act on hull of boat then it will be necessary to connect it with some place on boat or at Engine where outside waves cannot reach. Herman thinks this will work

Sunday 23 230

Very clear day. white daylin coming from Grassmount + just passing plum Island light
Hours with Eye
No 5 boat. One mile away it is barely visible ½ mile
fleecy clouds in front of sun – There are fleecy clouds around point of

Hexagon – White Caps –
1/3 of Boards blown down
sky blue color free from
Clouds
There are rifts in clouds

A – 80% Ultramarine wife says
is Lavender – to me its not
blue at all but a reddish tinge
color of indeterminate character
its Color stands out
clear from the other
5 boards blown down

3 o'clock PM
No 3 which has a tinge
of blue in the white 80% Needle
is least Conspicuous 1500 ft
away with full sun light
fleecy clouds in front of sun

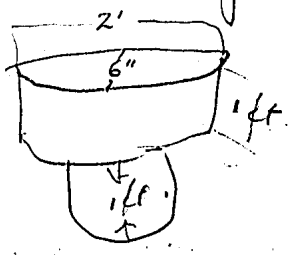
Also the Color of 3 has a blush
Cast & nearer sky line Color
than any others – the next
one No 4 is yellowish white

We should try if we can
hear a Bell from Bryan laying
on Boat Engine stopped
+ turns new revolving
Reservator + then start
Engine –

A Rake Bryan 1000 ft
long by 1 square of distance
assuming Engine & boat
sounds are 100% on a
line 100 ft long – then on
a 1000 ft line it will be
reduced to 1% or 99 times

Nerium figures that a 3/8 smooth rope-Towed between two to obliterate them 2500 ft long at 11 Knots per hour will have a pull of 189 lbs –

and the Bijou



This will have a pull of 49 lbs –

Nerium thinks if boat Towed Rope strain wouldnt increase more than 15% as it would follow

The wake of the ship which is line of least resistance

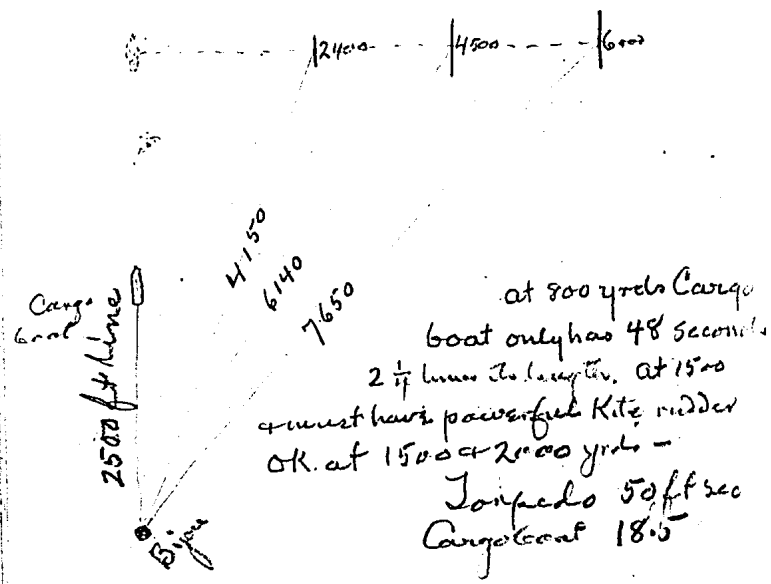
Pull on rope is directly as to the length,

2400 yards 540 lbs plus 50 lbs for Bijou

Nerium says of Rope 2500 ft or more 100% at end of 100 ft line, the noise at 2500 feet be reduced 16%

800 yards –

Norman figures



at 800 yards Cargo boat only has 48 seconds 2 1/17 times the length. at 1500 must have powerful Kite rudder OK. at 1500 or 2000 yards –
Torpedo 50 ft sec
Cargo boat 18.5

Sub	2000 yards	Bijou	2420
	1500 "	"	1951
	800		1341

If strength of signal from Torpedo is assumed to be 100% heard direct from ship then

	Ship	Bijou
2000 yard bottom.	100%	68.3
1500 " "	100%	59.1
800 "	100%	35.6

730 am Sept 24 1917

Heavily overclouded all over no sun can be seen but light is excellent. Sea generally diffused all over about the same. The 12 white boards do not look black at all but hazy white at a distance. When Sachem taps at the usual place 1500 to 2000 ft all are white

It is difficult to say what is needed to make them match the sky line but think should be a little lighter — it would only require No 11 which is the coloured to have a very small amount of light to be squeezed out —

Sky line appears white no. or a trace of blue extends up several width of the boards

It is evident from this that the more cloudy it is all over the more general is the lightning ~~eff~~ now

of the sun direct rays can shine on any object. Hence all is diffused light or white. Even in the morning is able to almost be out of silhouette but would need some are lighting but not if there was thicker clouds.

It is probable the Eastern side of the boards would be a shade too light & would have to be darkened although the light seems to be seen in every direction generally diffused

8.25 AM — No 11 is now exactly like the sky line This is the pure white one.

Scarcely any haze.

8 50 am. all disappeared Except No 1 & 11 5 & 6 best
dont have to squint all you can see is the support sticks. The 11 & 1 are the whitest. 12 is against the fort.
The light has increased so 1 & A or 11 which is pure white are more conspicuous from increased light while the others only showing one coat of white over the previous black stripes are not pure white —
The sky line has no tinge of blue as its probably all clouds
This shows in cloudy weather the shutters from 8 am is OK for all day &

light would only be needed from Aries from 4 30 till 8 am —

9 am Sun is showing there fairly can see shem on letter but cant see run of one of 2 of the boards not pure white are invisible

9 10 am - This would be considered a fairly light day. One can see where sun is by the clouds around it being a little brighter than those further away but that is the only evidence of the sun. The darkest white boards are not becoming whiter but only

takes a slight squint to
make them invisible -

920, Can now see the
Sun shining thru clouds
but can look at it
it appears bright but
it dont hurt Eyes
also reflections on water
fairly good
two or 3 of the darker
tent white boards
are easily squinted
out, sky line same
tint & color as boards
no blue to amount

to anything but slight
bluish cast. Western
sky line fairly bluish -

The shadow side of a ship
can be managed in the presence
of clouds in the west covering
the sky. The greater the clouds
the earlier in the day will it
Camouflage - In a perfectly
clear sky its probable that
with all the arc lights that
could be used practically
that Camouflage would not
be effective before 10 @ 11 o'clock
Whereas light fleecy clouds
would start it at 9 @ 10
as clouds increased in density
the Camouflage would
start earlier, & with
entirely overcast sky
would probably start
without arc lights around
7 to 8 am - Earlier than that
would have to use arc lights

9.40 – ~~stern~~ sun now nearly gone – Clouds thickened near it boards can scarcely be seen even without aquant – Hull also same color as sky line +

9.52. are putting on 2nd coat white paint on all –
Can just see sun (dull)
All boards too white
~~+ [illegible]~~ + need toning down

10.35 am all white + all Camouflageable nicely

In any light where white board shows white against the sky line the Boat would be camouflageable
If ~~dark~~ white board shows dark it must be lighted somewhat till it shows just white against sky line when it would be Camouflageable –

Cargo Boat No 1 of Drawing
Requires 8664 square feet of Shutters for all sides + Ends
of this 4920 ft are for the 2 sides – + 3744 ft for both Ends of Cockpits stacks pilot etc – Nothing allowed for bow or stern.
perhaps 500 ft should be allowed for stern.
Making total 9164 ft Excluding the Hull –

This makes 18328 square feet of 1/16th thick of steel
44175 lbs of sheet steel
also bars 1" wide 1/4 thick
61 lbs to each section of 6x10
or 60 sq ft total bar iron
9164 lbs —

Hence 44175 lbs Sheet steel
9164 lbs bar iron
53339 lbs of steel

Amount for foot + holding brackets not yet figured + Control mechanism

150 lb furnished is $8,000.

153 sections Equal to 6x10 high required

Each section weighs 350 lbs
The moveable section
Consequently weighs 175 lbs
This will be a ok mechanical
Counterbalance if worm is used in Control

The chances are that double the lbs of steel will be necessary for frame 18328 lbs instead of 9164 lbs — but by bending edges + braces it may not be necessary

1110 am. now all boards
very white against sky
& Compasses. Can barely
see where sun is.
See quite rough a-boat
walking Wife in room
Sea sick — Not Hazy
Even less than in Clear
Weather Land on
Every side Can be seen
Plum Island Clear

Waves look big but
appear to be only
2½ feet from Crest to
depression - one was 4 ft

I notice fresh nets and net poles
are not carried away
although the waves over
big that passed them.
Neither is the 3/4 angle iron
on bell buoys bent although
very large waves pound them

I phenomenon I notice
in the tests that when
Sachem is anchored
2000 ft away & you
notice boards & squeak
etc then when you
start off & sky is bright
& no great amount of haze
distance dont seem

to effect at much showing that in 8 @ 10 miles the absorption of light is not striking, & the only thing that makes them disappear is haze. Rotundity of Earth. & atmospheric refraction near sea Edge of Course some is due to dispersion of reflected light over a larger area as you recede.

12 10 pm =
Cannot find the Sun - but plenty of light - Boards with 2 Coats all Very white -

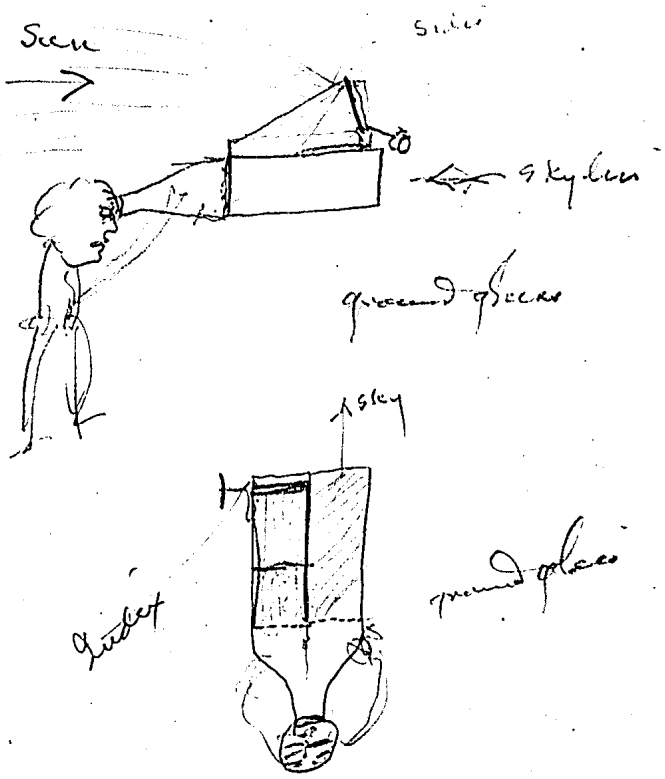
Scarcely any haze Plum Island & land on right clear only very distant land show a little haze - this is not true when Sun out & not clouded.

at 1 45 pm Sky overcast no sun but good light, Boards to Eye absolutely disappeared in 1½ mile (about) -

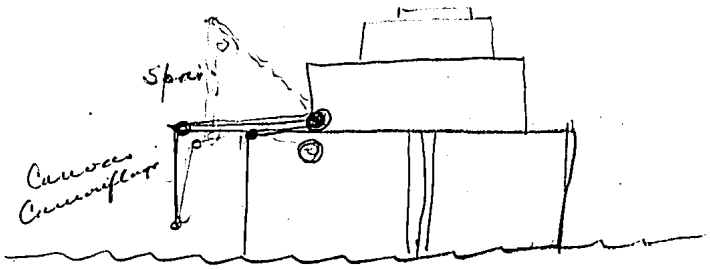
When about 1½ miles away at 1 45 pm I watch look till it disappeared with Eye & glasses it disappeared with glasses before Eye

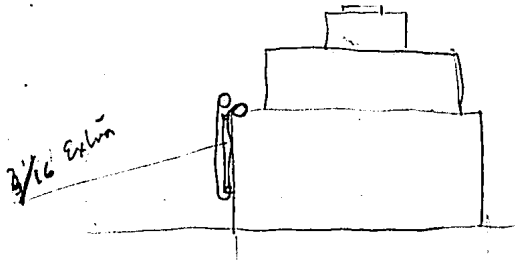
at 2 01 pm — Roughly
4 3/4 miles — Dock about 7 ft not
less — well measure ?
Once about 2 miles away
the Sun Eventually went
back of a thinner cloud
& let more light thru
& boards showed up
white but quickly
disappeared this
shows Central must be
quick 2 seconds &
Instrument used
to detect,

Camouscope — Tintoscope

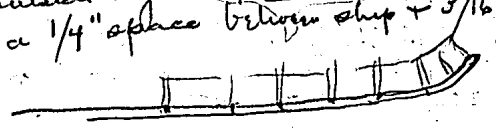


Tintometer

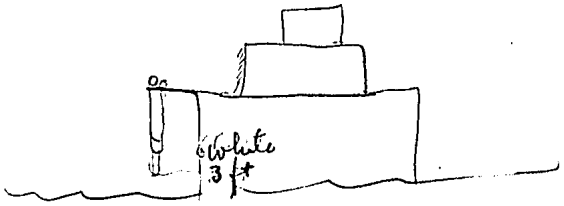




The 3/16 extra is fastened to ship permanently — Canvas passes over outside + goes up inside there being a 1/4" space between ship + 3/16

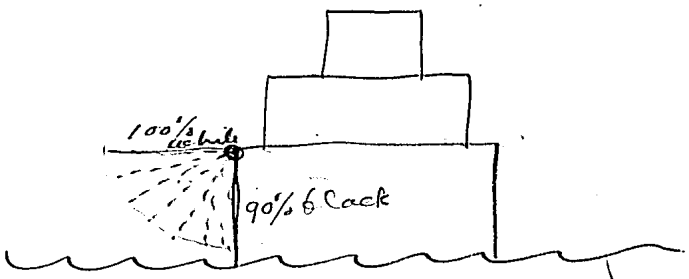


The 3/16 might be even needed a whiter —

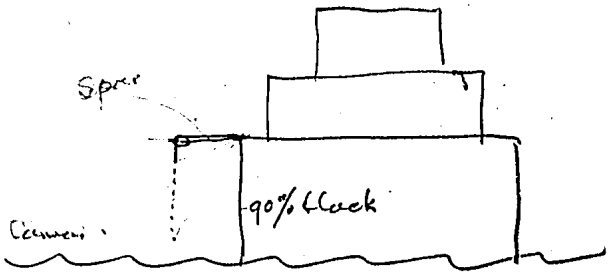


Canvas 1/2 black half white — When all white is wanted — the white side let down when all black is wanted black side let down when 3 ft white + 3 ft black wanted roll is adjusted

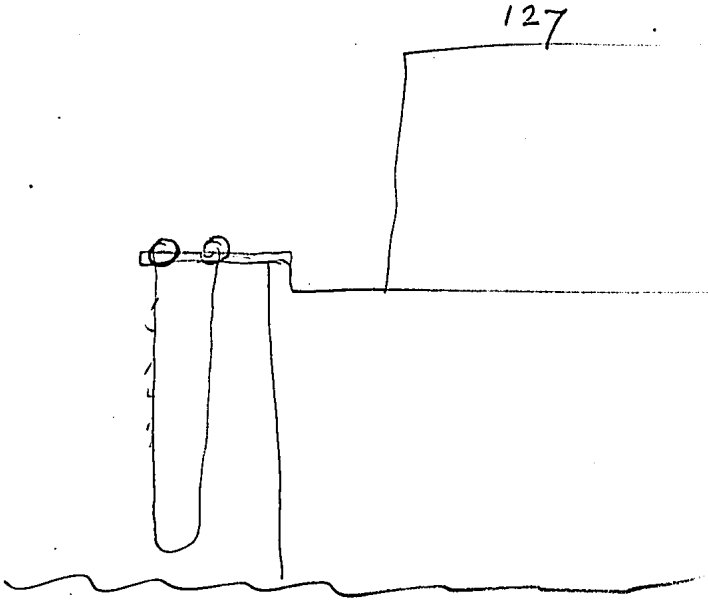
Its probably 2 stripes could blend at a distance. The ship 3 ft white together, with white + black ~~the~~ Canvas may blend



This will probably blend at a distance.



white Canvas, let it down or up to increase white + cover various amount of black.

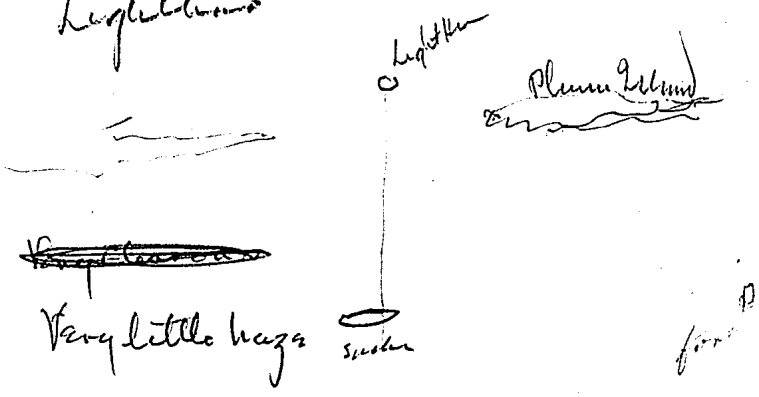


Net, 10 sections 10 ft long finer + finer mesh - Boat painted white, net yet black - out 10 ft from boom - Winds off one reel on to another When all white wanted Ropes nets all wound up

Sept 25 11/17

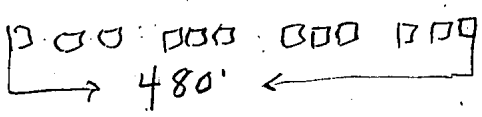
7-10 fleecy clouds on horizon & down but not many —

At 7 45 just see all the white boards not yet striped see them dark against sky line — just approaches Orient pt Plum Island & Lighthouse



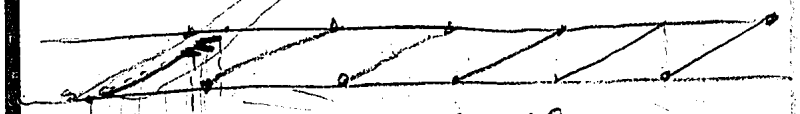
753 all very black —
Y note of Y look at them on Sun side of boat they are darker & sharper than of Y. look at them on shade side

Arrived 8.04. 19 minutes.
Roughly 3.6 miles @ 4½
at almost,
Anchored 807, Boards all white but too dark on aspect
but brightens as it goes from 1 to 12 This is due to angle with sun —
Board whose background is the fort from point where sachem is is bright white



One part of boat must be painted different from the other end according to position of sun no matter in which direction it is viewed by Submarine
(figure this out are safe)

small strings to reef the black each in -

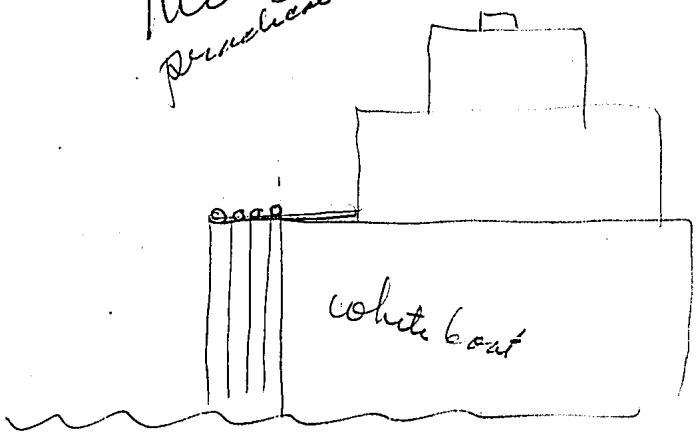


all the other cloths are white + hung permanently on Cables from a Boom between the Cables is the spokes upon which the cloths are secured ~~by~~ ~~the~~ Every alternate spoke has the black cloth provided with rings & by means of small Cords can be pulled out to cover the whites Entirely or reefed behind the whites a pulley is at End of every black cloth spoke for reeling in -

This looks good

The only question is will 1 foot stripes blend at 3 miles or less. 50.50 and well bottom of canvas strips get tangled by wind.

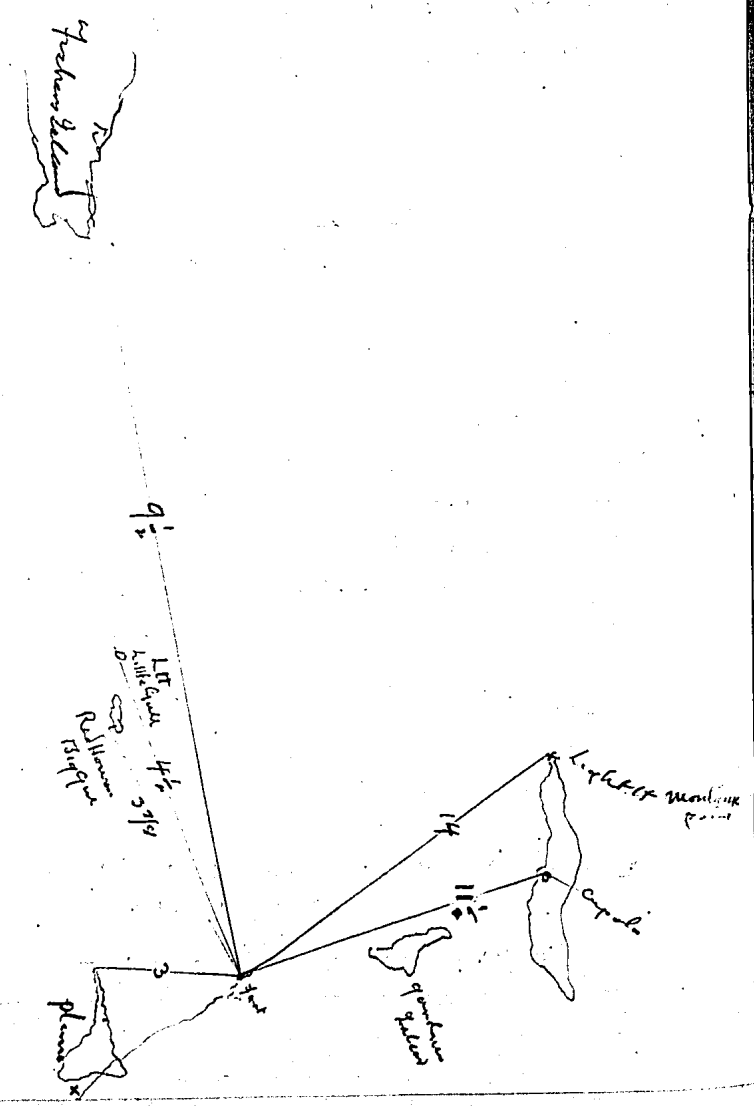
This seems very practical.



Rope netting jet black dy mesh or same mesh 1/8" cord mesh about inch hole.

~~Cords~~ Seams fastened to metal at roll. so each one when fully lowered, is little lower than the other & little more side wise

Sides brace. Opera house slings prompt extension for any lights when white needed



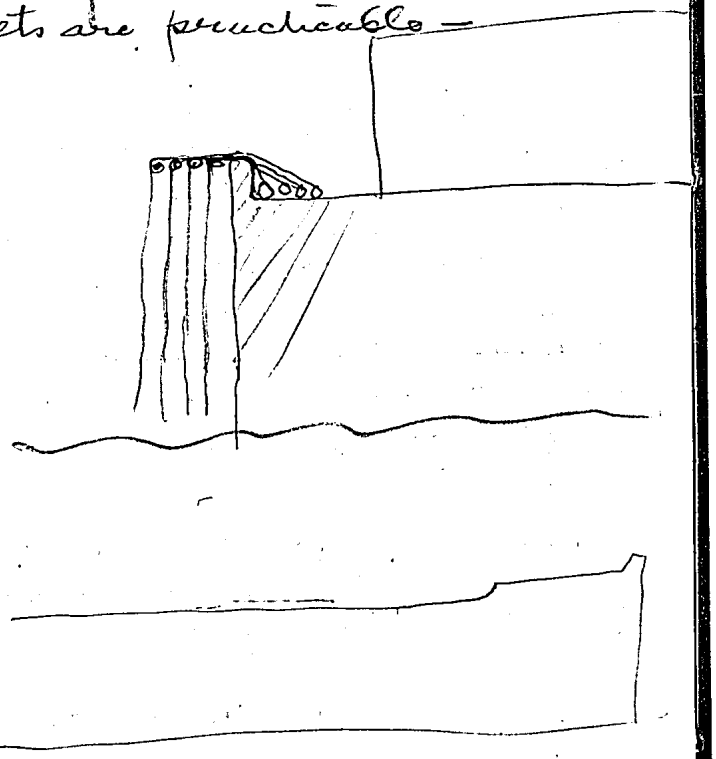
On Pilot-deck all points at 1120 am
Visible by Eye + glass

Sept 25 - All Boards had day previous 2 Coats Best white Lead paint —

We now paint ships using a shade of Prussian Blue - highlaned shade of shades blue + not black. using pure white lead to mix the thick butter of prussian Blue Painted 8 Boards No 1 is 95% Blue + Each Board has 5% less Blue Didnt finish 8th Board till 5 pm.

At 315 slight fleecy cloud overhead — No 2 90% blue best but a little darker than skyline
Continued next leaf

The Captain thinks the Seine Nets are punchable —



Must look out haont get a long black line when nets are up —

The Sachem is 600 yards away

Dont have the dirty bags of [illegible] when you try to agree out its more like color of sky line -

Think the Ultramarine seen the best as must agree with Prussian Blue when sun was right ahead here to agree with Ultramarine

I notice also No 1 has a tinge of lavender which was so pronounced with 80% Ultramarine

3 20 PM - No 1 (95%) is best can agree it out OK

There is no doubt but blues are better for sky line - when sun is West.

3 26 PM - Cloud came over Sun & Best was No 6 (70%) blue

3 30 pm Sun out & cloud again & No 1 Best, in 2 seconds cloud came over sun & #6 was best in 1 sec No 1 best,

3 36 pm Now all are too light the depth of shade with Blue [Prussian] is not enough to do the business on any board when sun is bright, it would require 97 to 99% blue of this shade,

Next time must make blue of deeper shade

It wants a blue that seems certain as it approximates the skyline better than Cardon

Also in practice with shells is

must adjust for 2½% increasing 5% on boards

Note

3 42 PM - Cant see Cupola on Long Island 11½ miles away haze due to position of sun in cloud

3 45 PM - No 1 entirely too white although before sun passed meridian it was apparently perfectly Black
as there is a clear sun & can't squint at cloud or anywhere near it

6 Boards now striped
Can even see stripes with glass on #1

3 50 PM - #6 actually appears white. Even No 1 is whitish

It may be we used too much white lead to lighten the shade of the Prussian Blue

that pure Ultramarine, or Cobalt pigments in oil without White Lead is best,

Note a sample of the paint painted on piece of Tin actually looks green today when Ultramarine was painted over a part of it The Ultra was a fine blue

4 15 No 1 to 7 too white

417 #1 by agent has a greenish tint – also it now reflects light + is not matte No 2 dont,

No 1 is 95% Prussian Blue thinned by white lead paint so shade should not appear black.

4.25 PM – All dirty white + NG – + Cannot be painted out in the dark,

437 PM – Only Gardners Island can be seen Neither LH 14 miles or Cupola 11½ miles can be seen haze thickens as it always does when sun is in a clear declivity – Houses on Big Gull getting hazy (4 miles) –

Something wrong with No 1 it seems to be very unevenly painted, in addition to sheen

452 PM – White boards not striped have a yellowish tint than glasses

455 pm – Big Gull haze increasing Cant see windows of Big Gull houses – a white line is forming at base of houses like land seen far away

5 PM – 3 4 5 6, 7 painted
#1 turn glaces, looks decidedly yellow 2 + 3 just a shade yellow – ~~8 Board~~

8 Board finished quit for the day –

5 07 Sun seems to be about 3/4 hour above horizon + in the yellow horizon that may account for the yellow tinge on boards – sky blue in craft yellowish –

5 12 PM #1 now lost sheen + appear Even colored 2 + 3 seem unevenly painted –

At all times there seems a very great difference between No 1 + 2 + the others, strip is narrow + probably badpainting

Can't quiet see anything in the least

5 25 Boat started for Home

5 27	5 beat	looks red
5 30	6 "	
5 31	6 "	
5 32	6 "	
5 33	7 + 8 gone	
5 34	1 2 3 4 5 visible	
5 35	"	"
5 37	"	"
5 38	1 2 3 4 5 + 6 visible with glasses	

all are considerably above sky line

5 40 PM Dock visible, altho Tide up + only 4 ft above water 1 2 + 3 visible

5 42 – PM 1 2 3 vis in glasses also dock The 5 unstriped white are very conspicuous Even to Eye

5 45 dittos

5 46 pm — cant see 1 2 4 3
only the 4 white Dock can
still be seen —

5 47 pm Dock & all gone
Except 4 whites. Can see
the later Even with the Eye
fast Hazy
getting dark

5 50 pm Can see 4 white
boards plain in glasses

5 51 pm whites twinkling

5 53 all gone

It may be essential to camouflage
between deck houses on Cargo
boat to prevent sub from
seeing dry part of boat
against the sea background
if we come close 3 or 4 miles

We are now making some
Ultramarine Paint for Camouflage
to restripe over & on Top of the
Prussian blue. This will make
a decided deeper shade —

We use "11 M" Ultra Shade
made by the Ultramarine Co
38 Park Row NY

We mix with boiled oil & very
little linseed so as to get a
very deep shade & add a little
drier, its about as deep a
shade & as thick as if well
worked penetrating

We are now going to make
some nets mechanical with
1/8" hemp cord & paint it
black placing 1 to 4
in front of a white board

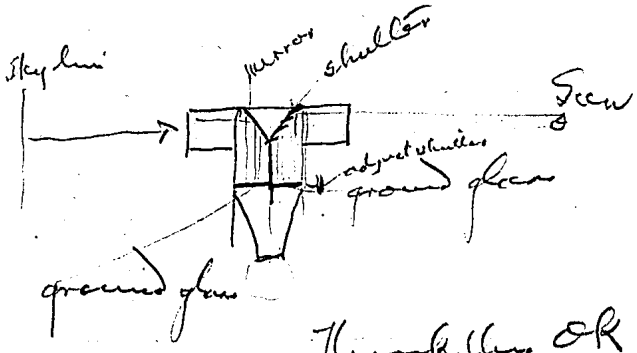
to hit the hull —

The whole Camouflage Science is to regulate the light reflected from the ship to distant observers so that the percent of light coming from ship shall be the same as coming from the sky line, then ship will be invisible providing the quality is the same. If 10% is reflected from sky line then the ship should reflect only 10% if it reflects less the ship will look darker ~~darker~~ than sky if boat reflects more it will be lighter than sky line —

It will be impossible to attain perfect Camouflage to observers at a distance in certain positions direct or at angles to ship —

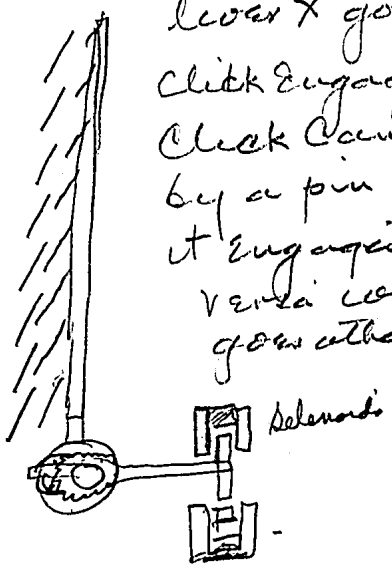
It is probably best to adjust for an observer at right angles to length

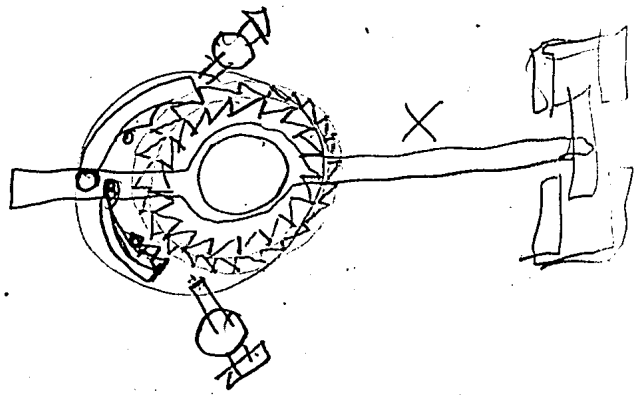
of ship as the ship is larger object in this position than any other, observers at a great angle will not get a perfect Camouflage, but there is some compensation in the object or boat appearing shorter on horizon

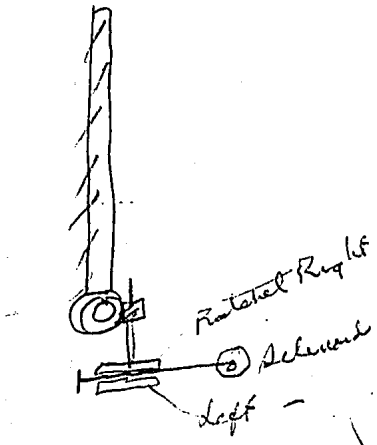


Think this OK

When central one click is out other in when lever X goes one way Click Engages & other Click Cammed out by a pin before it Engages, & Vice versa when X goes other way

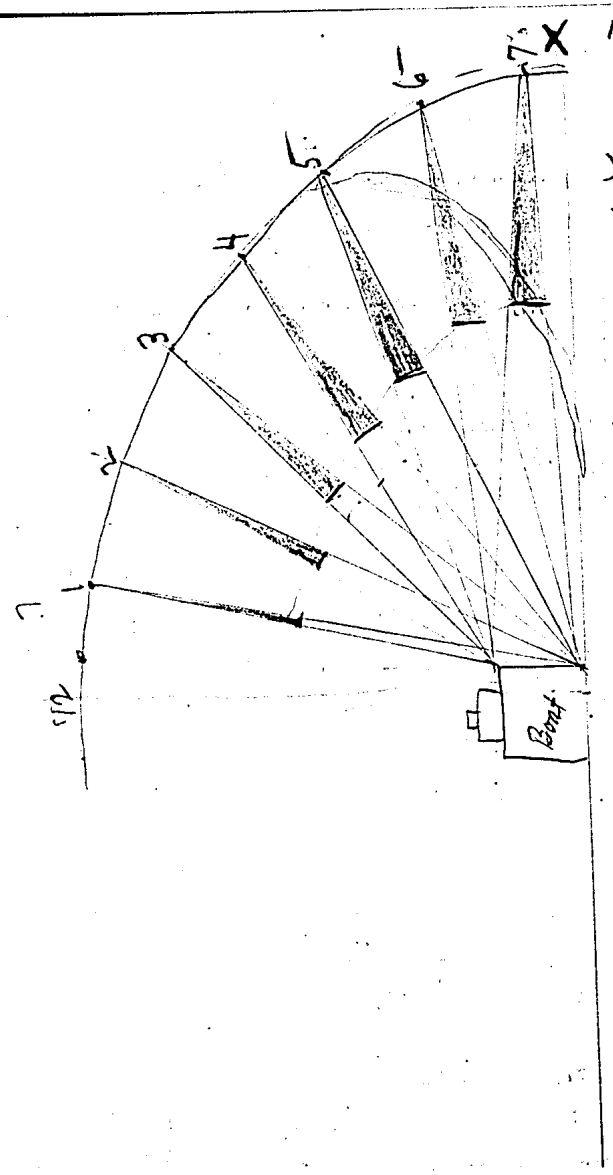






Worm interposed may take several reciprocations to advance one tint

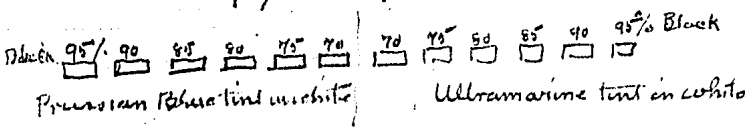
Think with bearings 4 ft apart can have one conical for every 4 sections 24 ft of torsion tube + rod used



Showing relative amount of light received at X

Thursday - 27

The painting over the Prussian blue stripes with deeper shade of Ultramarine blue did no good it was even whiter on 1 2 + 3 ele than with blue at 3 pm and strong sun. Do no other Color is deeper in shade than deep blue nothing Except Lampblack will do - Since it is impossible to get the blue sky tint this way I am now tinting the white with Ultramarine for 6 boards and Prussian blue for 6 boards each the replica of the other both start at 95% Lampblack



Striped with Lampblack in a little oil + considerable Turp - Poor quality of Lampblack + not mixed well, lumpy

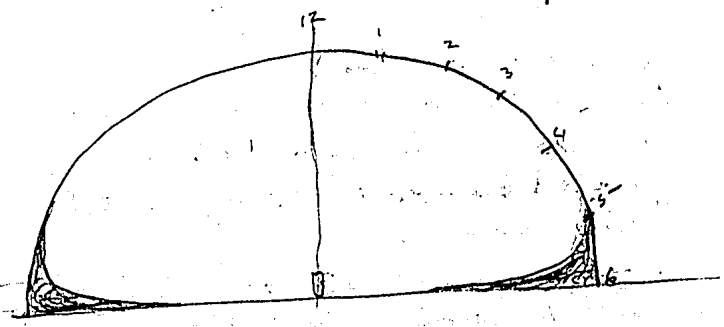
The White tinted with Prussian blue looks green - The white with Ultramarine looks bluish both very faint.

It may be it wants a little more Ultramarine to match very blue sky line

For some reason the Lampblack looks grey Even ours look that way but not so gray as Conch —
Find out best liquid to use to make it more black & do away with the grey.

Have sent to Warrenson, of Lamp works to send complete men down to measure reflected of Sunlight from ~~Sun~~ 4 30 am to 7 30 pm on Cutter —

Sept 27



This diagram shows light lost by absorption in the morning & Eve as shining on a ship —

This of measured for several conditions in addition to loss from ship by angle of sun light striking the boards should make a resultant that will be valuable —

Instead of filling shutters up 10' high 6' wide to gether to put them up 6" high and many feet long so strips instead of being horizontal are up right The the removable black strip frames can be provided with hook & catch + Coach-bolting will not be necessary + the shutters can be moved easy from one motor room of 58 ft long but the frames must be hinged together so there is no slack

This get rid of the shadows cast by each wing of shutter

I noticed when I mixed Ultra M blue with the white that at a certain point a strip painted with pure white appeared as a shade yellow as against white. Tinted with Ultra M the blue like blueing in washing connects the two things, and I had to use considerable Ultra to get it to show signs of a blush tinge — I suppose the yellow tinted impurities in the white were cause of yellow cast —

Another advantage of having the shutters perpendicular is that the vanes not bow but hang & have no tendency to bow — On account of the

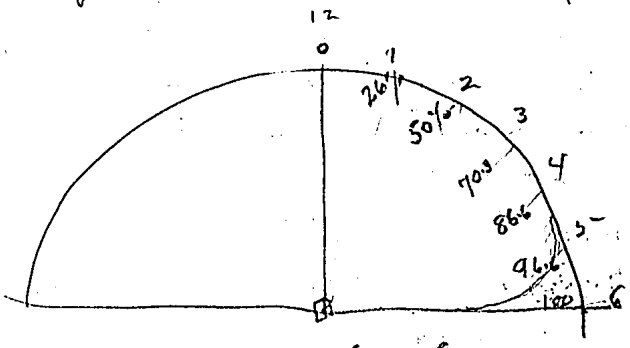
loop ~~the~~ should be in this position for sailmaker ahead, — on account of the loop — the end of the black can be painted white (1e) 5% as we never need more than 95% black & need 100% white

28th Sept — Wind from S.W. Raining & blowing no shadows at 7.40 am Except a faint lower & brighter light practically Even all over

10 am cleared up not raining but no sign of shadows rather ~~being~~ bright cloudy day not dark

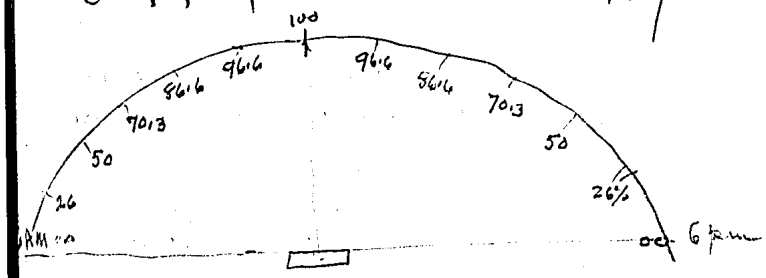
Think in winter when spray freezes
Can cover everything (shutters) with
Canvas, ~~with~~ then in zone use
steam pipes behind port strength
to prevent freezing - Go ask an
English Cadet,

Sept 28



ship going North & South -
moment of light theoretically
reflected from ship from observer with
west,

Ship going East and West.



from Motions gone thru with
Lyle gun I think we can
fire 3 per minute - probably
only 1 per minute will be
necessary - 60 hour 180 @
200 for a fight.

Outside of hull think Canvas
shutter 3" strips of Canvas
can be used - with strong mechanical
device fixed to rail - the blackbeing

on range & slide in out by a general
Rad & whale sub marin –

29 Sept 1917 – Very Calm – no cond warm –
Clear day bright sunshine
few fleecy clouds over head
Coming from Freeport
in morning – All the board
(12) have 3 coats best
white lead paint with
the Blue tint of prussian
blue very very faint on
7 & 9 10 + 12 + blue
tint of Ultramarine on
1 2 3 4 5 + 6 –
All the way to Fort Boards
dark, a sort of a hazy
dark – Arrived at
8.20 am. 400 yards
from boards which

are a light black against a
very bright sky line in the
East – The sky line is white
probably due to clouds &
haze –

Little & Big Gul + LH. clearly
Vis by Eye. ditto Gardner Island
& Island –
Cant see Cupola or LH.
+ only a little of land beyond
Gardner island Can be
seen as sun is too
strong on water reflecting
sun sheen on water in
line of Vision.

8.30. you can see that board
are white but the sky line being
so very bright they all
look blackish & against
very black –

9.17 - sky line not so bright, boards getting colder, some fleecy clouds in West coming - fairly high up
boards look dark pink white, can squint their semi white but office is strong sulphur —

930 sky line not so bright, boards now look pretty white, hazy clouds around sun & some very thin hazy ones with coast fairly high up. Can't squint anything out, —

Standard striping as described in p 151 —

Sky cannot be called clear as very light clouds coming over all gradually thicker secondary boards are showing so white so early — perhaps the slight blue tint is helping. sky line has a very faint blush tint now

10 05 am - boards look very white but can't squint out fleecy clouds -

1025 Can't squint out yet, sky getting more clouded sky line still white but not quite so bright as hour ago. there is a very faint trace of blue in it

1012 now striped, it appears dead black with glass can just faintly make out that it is striped

1037 AM Can just notice that squinting has an effect.

A Greenpoint - Jupiter 7½ to 8 miles off is clearly visible but hull is fair & better than derrick of which there seems several sun is full on side towards us — or 3 @ 3½ beyond lighthouse on gull island

1103 am Can entirely squint out 8 9 10 + 11 - (12 is eliminated) why 1 2 3 etc cannot be entirely squinted out is due to complexity of the boards to ours + position of Sunshine very light clouds nearly cool white horizon 2 or 3 of the boards could not be seen without squint of the side timbers were not there - when squinted only these timbers are seen

We are so close to boards today that 1 2 3 4 5 + 6 are above sea background + 7 8 9 10 11 + 12 just on Edge of sea skyline -

11 12 am - Prussian blues have a greenish tinge - now the Ultra is better than Prussian blue which is getting whiter but V faint greenish tinge,
So far Ultra M best, I think

also shade could be a trifle deeper blue without harm - as sky here now has tinge of blue

1125 am boards all too white now can't squint out any but one corner of No 3 is absolutely invisible without squinting - probably paint was not cleared enough on 1 & 2 - Think slightly deeper tint should go on white on Ultramarine End -

11 35 am - greenish tinge now disappeared from Prussian blue boards - 1 + 12 getting lighter shade - boards (white) getting very white -

1155 - skylens at boards
now distinctly blue
So far think Ultramarine best, but there is very little difference, but still think shade of blue should be deeper - so the white in shade should be distinctly blue & not as now scarcely detectable - Can determine best at Laboratory by weighing & looking against an skylens -

1210 pm - boards very white
1 & 12 painted No 2 partly
1 & 12 getting lighter shade
grayish black - No 2
shade lighter as far as
finished - Light fleecy
clouds less than at 11 am -

1230 pm No 2 shows
signs of squinting out, its grayish
No 1 - on 12 no signs squinting out
(low tide) -

1 am - light flecky & separated
clouds part sky blue
No 2 just shade squintable -
Part of No 4 being painted & is
almost like skylens

10.5 pm 7 shows behind centre seen -
fairly well - Cupola on LH on main
land - beyond grandstand which can't
be see only light haze -
quite thick sky line in north,
which is south - sun not
bright, cloud over it, bank
striped look black

116 pm - Corner of No 4 striped
Entirely squinted out (sun out from
under S.C. fog -
Now get reflections on water
from white boards -
Haze strong in West & generally
resembles Calm and warm summer day

2 30 pm No 4 almost color skyline only partly penciled — at one time accessories of Board cut away without equipment, 11 + 12 now stripped + 1 + 2 4 partly —

2 45 pm No 2 + 11 almost equitable but No 2 best,

3 12 pm No 3 is best 10 second best fleecy clouds near sun — wind now from southwest, sea getting choppy 6" waves

3 35 No 4 is best, Eastern skyline very blue
Boards that are good have not yet the right tint it is a dirty blue. Combination (12) not real blue & it may want more ultramarine which would be good for the morning moonlight — & the lampblack should be blacker not gray — but they are very close

When one is right for the sun —
So far Ultra 11 best (10 some clouds to boards today Ultra my pronounced second & Chrome & Ultra & Clear with the greens

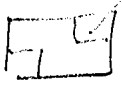
4 05 pm 3 is best but it has a yellow cast against blue tints of sky line. Think want more Ultra in white or lamp black yet matter + black not gray as it is —

4 25 pm 2 + 11 best, 2 better —

4 40 5 the best,
red tint in Western sky on some of the clouds
light getting clearer + clouds thickening —

6 + 7 not stripped best going for Coal to Newcastle

Left 505 — Grounds all dark —

515 — The  white NO 5 —

no white seen with glass

4 5 to least visible

The Corresponding one on

[illegible] side is nearly as good

520 pm Cirrus see NO 5 + 8 gone with glasses —

NO 5 Vehicles not fully [illegible] to least visible

6 & 7 are still white —

Not striped had they been striped they would have disappeared before 548

3.1 Miles — to Francy

bright daylight yet

What surprises us the reason to see the white [illegible] on NO 4 [illegible] horizon

It may be our stripes [illegible] much [illegible]

Oxychloride of Bismuth is known as "Pearl white" for paint

Sunday 30 Sept

I notice at 515 going from N London to Grangemont that there were clouds on the whole horizon & that the sky above a dark cloud bank on sky line was light reddish all around the horizon

Sunset no rays black background on saw big rain storm coming from West, Lightning —

Sept 30th

Percent to date of progress of Experimental part.

	Percent finished
Camouflage.	80
Smoke bomb 3" gun	80
Periscope sighting	75
Lyle gun smoke bomb	~~50~~ 60%
Kite Rudder	50
Fake Steamer smoke buoy	60
Torpedo detector stiff	90% Brotherhood yet
" " Moving	~~40~~ 50%
Submarine detector	00
Under Water projectile + gun	50
Anthracite Coal in D Zone	100
Cutting Masts + stacks	100

Oct 1st 1917 —

Morrison now at 9 am measured the sky line between boards gave 432 Candle power or lumens per square foot.

By Eye dead white No 6 is darkish clouds in sky cloudy

line but fairly blue overhead at 9 am clouds all overhead where have they come to probably there East wind blowing so strong are transparent —

All painted (12) stripes

11 35 am — 6 is very considerably lighter + near sky line than 7

12 is darker than 1 —

Thick isolated clouds come over now frequently.

at no time since 11 30 could No 6 be entirely separated out — Now 11 50 am —

Note Morrison's expert says 6 X 12 board on coat facing East Only has efficiency of reflecting light of 65 %

I think the shutters should be polished Nickel or tin & the paint put on it o.o. as to increase efficiency for reflecting light — We should get 80% efficiency which will help very much in the shadow side

12 noon sun free of clouds
No 6 nearly equivalent cut
7 not so close —

Note = heard Dreadnought guns probably 10 @ 12 miles away firing at target the 2 shots close together strong Edison heard & easy for a microfone we have

12 07 Can just equal cut —
No 6 but well differently
7 not so good

Note Vol II part 1 Kilmorgan p 222 says in periscope only 20% of the light reaches the observer
We a standard periscope length 22 ft Dia of @ 6"
Lapping at head to 2 ½"
19% of light seen is useful
Water in bad Thus wide periscope

12 37 pm No 4 is best but
Can't be equalled cut accurately
1 10 pm No 5 best, cloud islands
1 16 4 best.
3 07 4 best

Don't think tinting with blue is any good - did better without it — 5% is about largest
not less than 2½% is required —
Wants a better white

Note = First blood for hydrogen — 45 deg Exploded too high up — had no rope

35 deg — exploded near water but tumbled had no rope —

4 oz for propelling
6 oz for bursting — black powder 1/16" grain

800 cc about.

Smoke OR as to oxygen —

When can stop tumbling & get near sea level, it will be OK!

3 25 PM 4 Best nearly against out, still traveled with Isolated Clouds

It seems that the skyline does not vary much in Candle power up to 3 pm, just getting very 10% brighter at 3 pm. Yet the light from Cumulus varies considerably from 35% white to 20% white. If there were no skyline to compare with the shutter would be necessary to make boat appear neither white or black — This it does OK but when quality is concerned & comparison made with Sky line which is blue the comparison is not perfect. There is an illusion something needed, as when nearly disappearing there is a hazy extremely light tint of black smoke which is on the verge of disappearing. It may be due to 5% measurements too great

or count of a blue tinge,

If it needs bluish tinge it should not be in the white it might be mixed in the black, but I suspect our white is not good + has some black in it or yellow + that when polished Nickel or aluminum is used + a good white pigment put on this there will be less improvement Linseed is yellow + dries yellow + some white substitute should be found possibly the Colodium compound or Silicate Soda or a white resin Varnish W W Rosin Etc - Should also be matte + Black should be dead black not gray + also matte film -

4.20, pm No 2 + 3 East
Cant Entirely equint out that hazy yellowish lump left

5.25 - Sun just setting -
#6 too dark cant equint it all all -
1 + 12 black - big cloud deep on Western sky line -

5.50, No 6 + 7 equints out
ok - dusk - 1 + 12 very black -

4000 ~~000~~ each side –

192 | 8000 – (41.6

768
320
3192
1280

16
12
32
16
192

465
41.6
279
465
1860
1934 –

15 Tons

12
30,000
3,600
1000
500

66 are
33 [illegible]

2 | 133
66

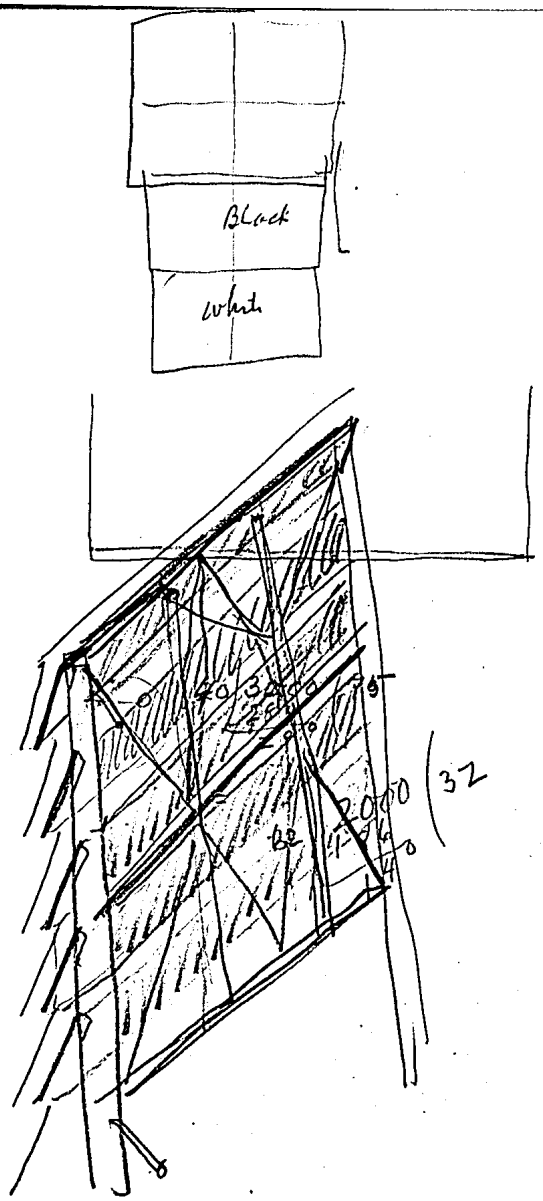
60 | 8000 (133 –
600
2000
1800
2

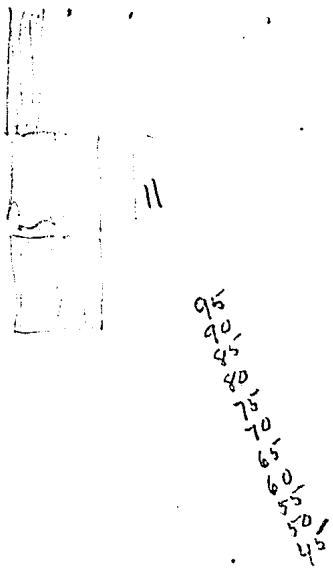
3
| 4000
66 | 250 | 4
264

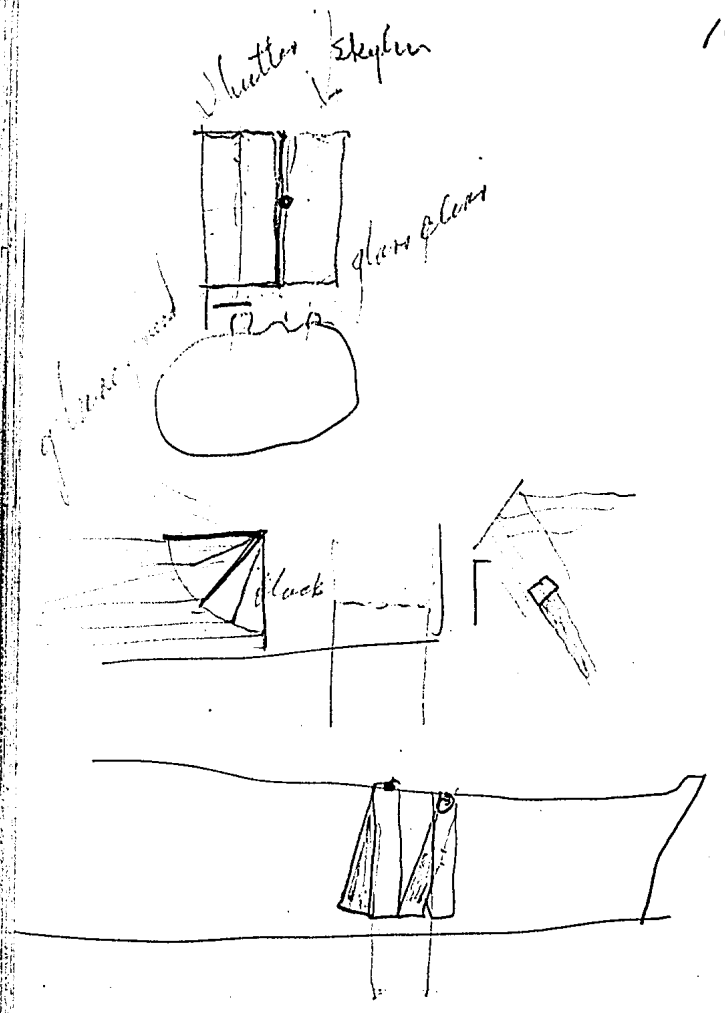
465
41
465
1860
19,065

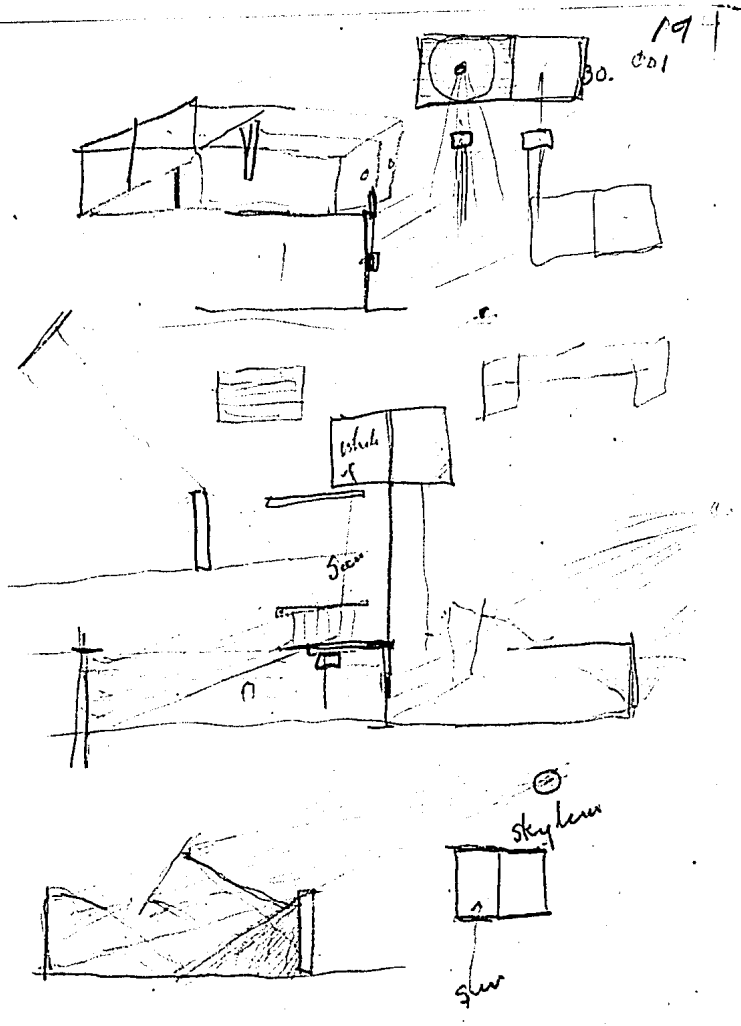
```
        1134
          41
        ----
        1134
       4536
      -----
5280) 46494 (88
      42240
      -----
       4254
```

```
        1134
          46
        ----
        6804
       4536
      -----
5280) 52160 (9.85
      47520
      -----
       4640
       4320
       ----
        320
```

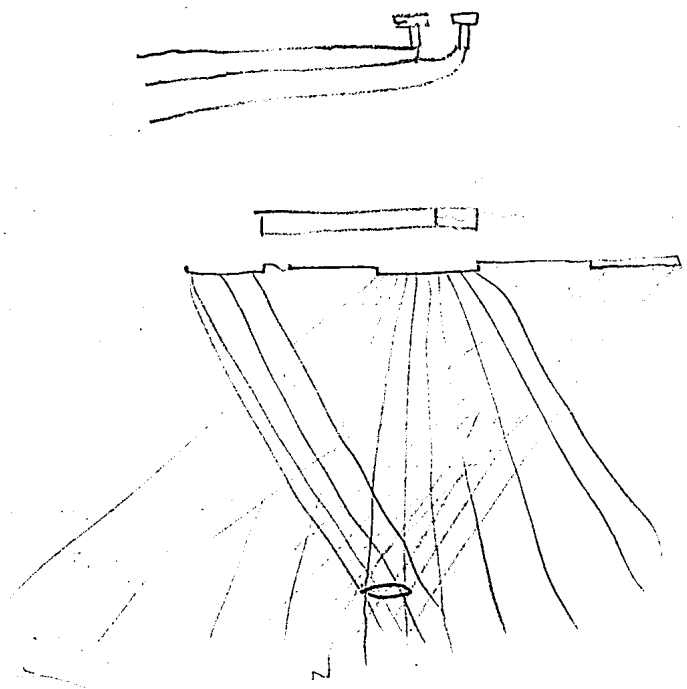

Black
White
40
34
95
20
00
32


11
95
90
85
80
75
70
65
60
55
50
45

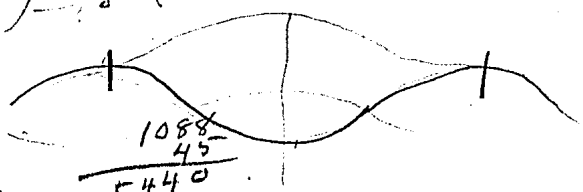

Shutter
Skylight
glass glass
glass
black



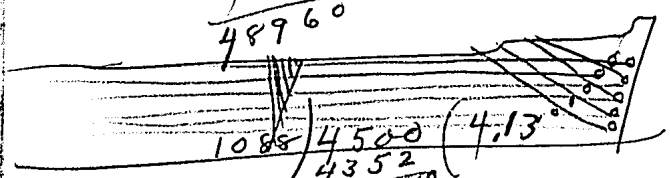
100	100
200	25
400	6,25
800	1,562



60) 250 - (4. second)
240
10



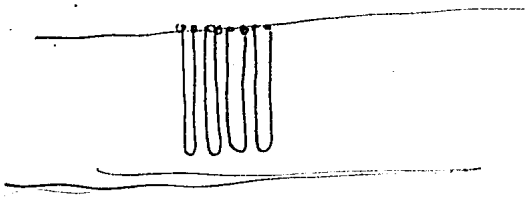
1088
45
5440
4352
48960

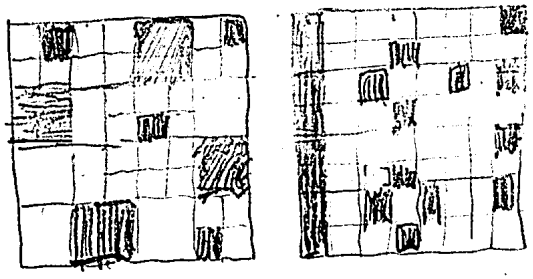


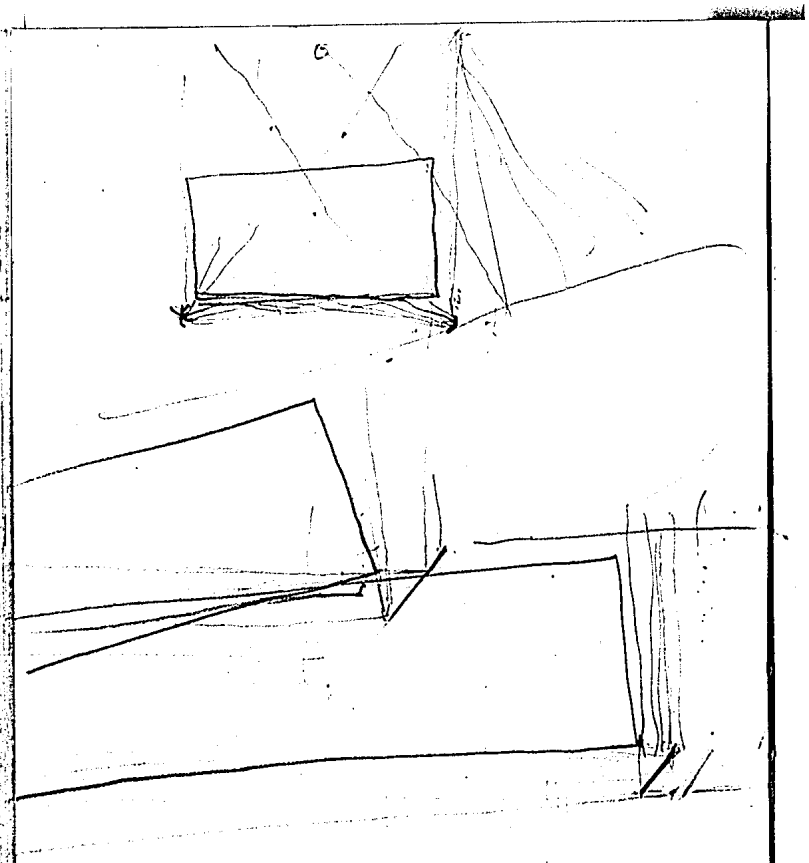
1088) 4500 (4.13
4352
1480
1088
3920

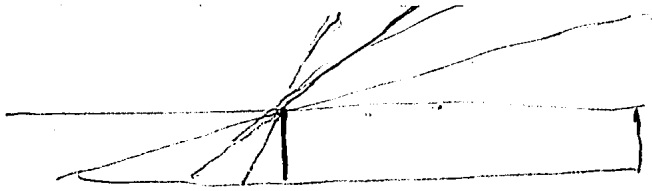
4) 1088 ft
272 ft
4
16
8
2
272
1088
1123.36

2) 1123 ft
561









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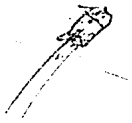
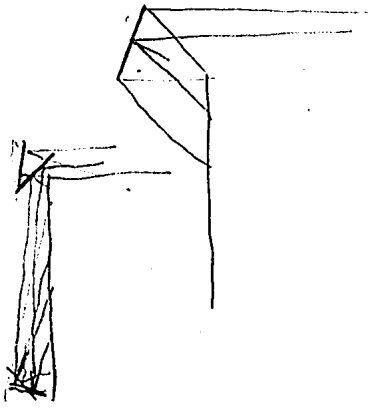
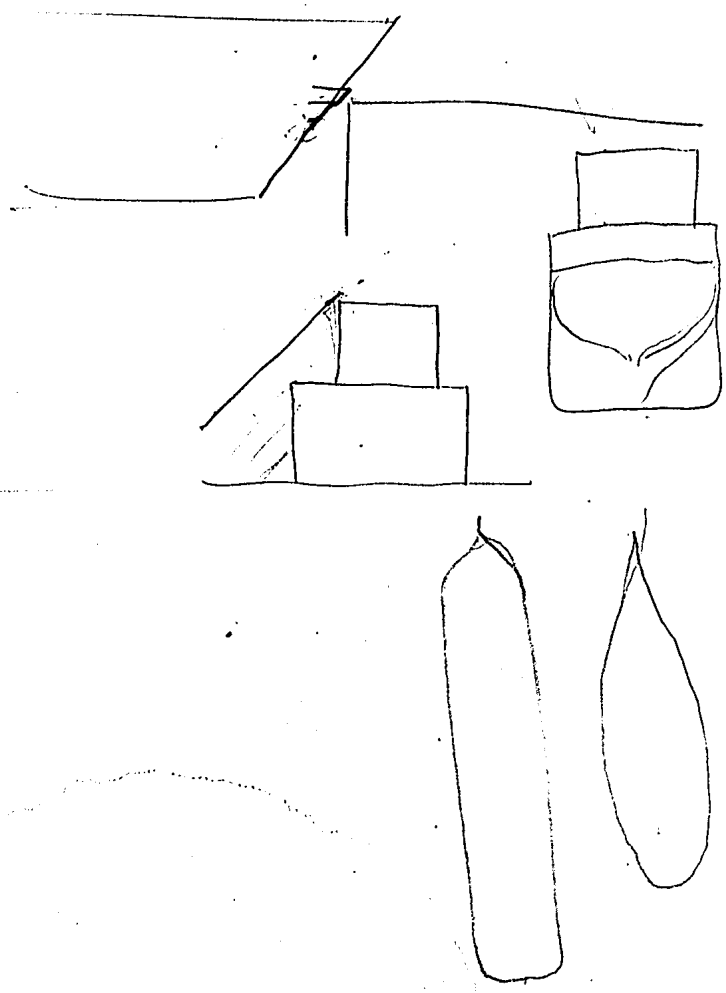
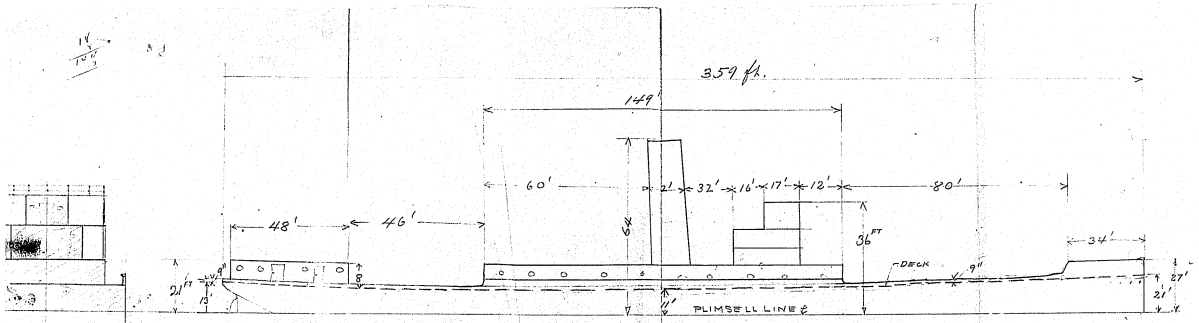
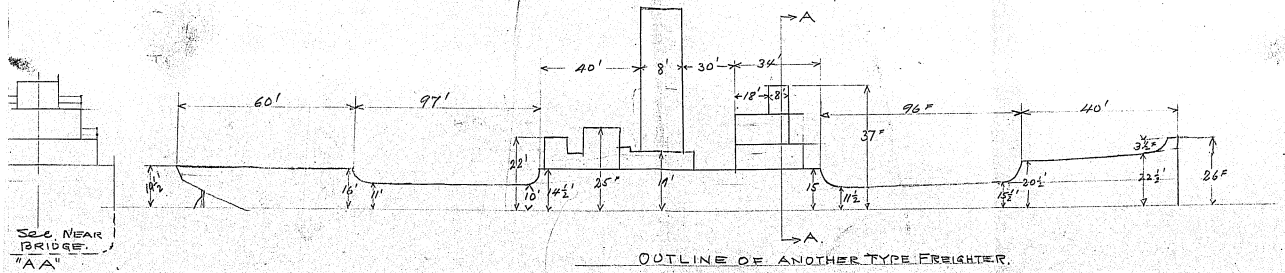






4.30 — Rosey — East
& starry — all black

Can see that No
8 & 10 is not so black
as No 1

Rosey extends equally to plum
island, + land on left

[ITEMS(S) FOUND IN BOOK]